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The Geography of Kalidasa

By

Mr. C. Sivaramamurthy, B.A., (Hons.)

There is a much more pleasant study of Geography possible from the works of the Great Poets than from the text-books on the subject. This fact is made clear by a study of the various standard authors. Kalidasa is no exception to this, and in fact ranks as a very great Geographer. In India it is customary with the poets to describe the seasons, the sunrise, the sun-set, the moon-rise, the flowers, the various natural phenomena, etc., all of which are in one way or other connected with Geography. Even topographical details are well-known to our poets. It is no wonder, therefore, to find Kalidasa giving such an astonishingly accurate account of Indian topography. The two works of his that give us a good deal of information of the various places of India, their locality, surroundings and special features in his time are Raghuvamsa and Meghaduta.

Kalidasa was, of course, familiar with the traditional Geography of the Puranas, for he refers to Lokaloka and Meru mountains, the various Varshas, the moon's ambrosiac body, the legend of the ocean (Sagara), the heavenly Ganges, etc. But being a rationalist, he does not give to all these that importance which the puranas attach to them. Some of his observations surprise us even to-day by their accuracy of detail. The people of East Bengal (Vanga), for instance, are as naval in their temperament to-day as they were in the time of our poet. Corroborative evidence confirms many such facts even when they refer to countries outside India. That the East Indian Archipelago abounded in spices was not unfamiliar to him. He knew quite well that the Persians had big beards and reared horses.

The 4th canto of Raghuvamsa where Raghu is described as going on a conquering expedition gives us a fairly vivid idea of Kalidasa's Geographical knowledge of India. Going eastwards *from Ayodhya he turns to the South from Bengal,* travels over the whole peninsula keeping to the coast, conquers Persia and other places, and finally returns to his capital. Kalidasa here takes the opportunity of introducing to us the various kingdoms he subdued, giving us incidentally some idea of their extent, crops, special features etc. Again in the 6th canto Sunanda is made to repeat the glories of each kingdom to Indumathi in her Swayamwara. Putting together the information supplied in both these cantos we get a fairly good idea of old India.

After a beautiful description of the autumn season the poet talks in the 4th canto of the king's march for victory. He is made to go first towards the east and reach the shores of the eastern ocean, dark with palm-groves.[1] The Suhmas voluntarily submitted to his overpowering sway. He is next depicted as conquering the Bengalees whose main strength lay in the navy. The poet here talks of the various strips of land at the mouth of the Ganges as the places where Raghu erected monuments of victory.[2] Raghu then crosses the river Kapisa through a bridge of elephants, and after subduing the Utkals proceeds towards the Kalingas. The river Kapisa is most probably the modern Bengal river Kasai which might have formed the border of Bengal and Utkal. The mention of Kapisa is one of the many instances of Kalidasa's love of detail and close familiarity with local peculiarities. The short way in which the poet disposes of Utkal shows us the comparative insignificance of the kingdom. Here Raghu is depicted as spreading his high military glory over the peak of Mahendra mountain.[3] He is attacked by the lord of Kalingas whose chief strength lay in his elephants.[4] Even to-day one of the most important places in India where elephants are found in plenty is the hilly portion of Orissa of which Mahendragiri forms an important part. Kalidasa here describes the victorious soldiers of Raghu as drinking cocoanut wine from vessels made of betel leaves, thus hinting at the abundance of these two products.[5] It should here be noted that the

1 प्राप तालीवनश्याममुपकण्ठं महोदधेः । Canto IV sl. 34.

2 निचखान जयस्तंभान्गङ्गास्रोतोन्तरेषु सः ।Canto IV sl. 36.

3 स प्रतापं महेन्द्रस्य मूर्ध्नि तीक्ष्णं न्यवेशयत् । Canto IV sl. 39.

4 प्रतिजग्राह कालिङ्ग स्तमस्त्रैर्गजसाधनः । Canto IV sl. 40.

Note.—The name Gajapathi *of the Rajahs of Vijayanagaram* is perhaps a borrowal of the title of the Kalinga Kings who were lords of elephants.

5 ताम्बूलीनां दलैस्तत्र रचितापानभूमयः ।
नारिकेलासवं योधाः शात्रवं च पपुर्यशः ॥ Canto IV sl. 42.

betel leaves of that place are rather very big in their size unlike those of South India and could well be made into vessels. In canto VI Sunanda describes the king of Kalinga as a powerful monarch strong in elephant force and lord of Mahendra and the ocean.[6] The ocean with its waves visible from the palace rouses the king from his sleep by its loud roar.[7] The shores of Kalinga are noisy on account of the rustling palm-groves and the sea breeze is sweet scented because of the lavanga flower from far-off islands.[8] Here Kalidasa shows his familiarity with the Archipelago where cloves are in plenty.

Raghu is next described as marching towards the Cauvery in the south keeping close to the shore which is said to be covered with rows of arecanut trees. The Andhra territory is slurred over even though the Godavari is a familiar river to Kalidasa. Perhaps it was not a famous kingdom in those days. Raghu encamps in the valleys of the Malaya mountain covered with pepper forests and haunted by flocks of green pigeons.[9] Cardamom is stated as growing here in plenty.[10] The great sandal trees having grooves on their trunks by the constant coiling of snakes are described as being used as stakes for tying the king's elephants.[11] The Pandyan king, who is represented as the lord of all this territory, is made to pay to Raghu a tribute of the best pearls obtained in the ocean at the mouth of the river Thambraparni.[12] The conqueror takes rest on the slopes of the mountains of Malaya and Dardura which Kalidasa considers to be the two breasts of that quarter with their surfaces smeared with sandal.[13] The manner in which these two mountains are described shows the abundance

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6 असौ महेन्द्राद्रिसमानसारः पतिर्महेन्द्रस्य महोदधेश्च ।
यस्य क्षरत्सैन्यगजच्छलेन यात्रासु यातीव पुरो महेन्द्रः॥ Canto VI sl. 54.

7 यमात्मनः सद्मनि संनिकृष्टो मन्द्रध्वनित्याजितयामतूर्यः ।
प्रसादवातायनदृश्यवीचिः प्रबोधयत्यर्णव एव सुप्तम् ॥Canto VI sl. 56.

8 अनेन सार्धं विहराम्बुराशेस्तीरेषु तालीवनमर्मरेषु ।
द्वीपान्तरानीत लवङ्ग पुष्पै रपागतस्वेदलवा मरुद्भिः ॥ Canto VI sl. 57.

9 मारीचोद्भ्रान्तहारीता मलयाद्रेरुपत्यकाः। Canto IV sl. 46.

10 ससञ्जुरश्वक्षुण्णानामेलानामुत्पतिष्णवः ।
तुल्यगन्धिषु मत्तेभकटेषु फलरेणवः ॥ Canto IV sl. 47,

11 भोगिवेष्टन मार्गेषु चन्दनानां समर्पितम्
नास्रसत्करिणां ग्रैवं त्रिपदीच्छेदिनामपि । Canto IV sl. 48.

12 ताम्रपर्णीसमेतस्य मुक्तासारं महोदधेः।
ते निपत्य ददुस्तस्मै यशः स्वमिव संचितम् ॥Canto IV sl. 50.

13 स्तनाविव दिशस्तस्याः शैलौ मलयदर्दुरौ ॥Canto IV sl. 51.

of sandal trees there. The Malaya mountain can well be identified with the Anamudi peak of the Anamalai-Cardamom hills and the Dardura mountain is most probably the Dodabetta, the highest peak of the Nilgris. The Tambraparni is the well-known river of Tinnevelly and the pearl fisheries of Tuticorin are as famous to-day as in the days of Kalidasa. In the VIth canto Sunanda talks of the Pandya as lord of the Serpent town (Uragakyapura).[14] This town is not yet identified correctly. Some hold it to be Negapatam. If Halasya Kshetra, the Puranic name of Madura, is a contracted form of Halahalasya Kshetra, then that town may well be taken as the serpent town. The Pandya king is described as the sovereign of Janasthana which is modern Deccan. Again the Malaya mountain is described as abounding in Tamala and sandal trees encircled with cardamon creepers, and betel-nut trees enclosed by tambula (betel) leaves.[15] The dark complexion of the king is explicitly stated.[16] The only southern ruler for whom Kalidasa has high regard is the Pandya. The poet is quite familiar with his territory. Perhaps the Pandyas were paramount in the south in his days.

The next mountain to be crossed by Raghu is Sahya from which the sea is stated as having receded far away. The Western Ghats even to-day go by the name of Sahyadri mountains. Here there is reference to a certain river called Murala flowing in the Kerala country and identified with the modern Kali river in the Konkan territory.[17] Kethaki bushes and palm trees are described as plentiful. Date palms and Punnaga trees are also mentioned. The poet talks of the kings of that territory as the western princes and they are in all probability the Konkans. The Kerala of Kalidasa's days must have included modern Kanara. Here there is a mention made of a mountain called Thrikuta.

The author next speaks of Raghu as proceeding by the land route to conquer Persia, thus hinting at a sea route well-known in those days.[18] The Persians are described as wearing helmets,

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14 अथोरगाख्यस्य पुरस्य नाथम् ॥ Canto VI sl. 59.

15 ताम्बूलवल्लीपरिणद्धपूगास्वेलालतालिङ्गितचन्दनासु ।
तमालपत्रास्तरणासु रन्तुं प्रसीदशश्वन्मलयस्थलीषु ॥ Canto VI sl. 64.

16 इन्दीवरश्यामतनुर्नृपोसौ Canto VI sl. 65.

17 मुरलामारुतोद्धूत मगमत्कैतकं रजः ।
तद्योधवारबाणानामयत्नपटवासताम् ॥ Canto IV sl. 55.

18 पारसीकां स्ततो जेतुं प्रतस्थेस्थलवर्त्मना । Canto IV sl. 60.

having moustaches and beards and possessing a fine cavalry.[19] Their women are very fond of wine.[20] The victorious soldiers of Raghu take rest in the vineyards, refreshing themselves by draughts of wine seating themselves on rich deer-skins.[21] The vineyards of Persia are even to-day very famous. It is a part of the religious duty of a Persian to comb his beard. Generally they allow their moustaches to grow long.[22]

It would here be interesting to note what the Persian poet Omar Khayyam says about the famous wine of Persia.

Iran indeed is gone with all its Rose,
And Jamshyd's Sev'n-rind'd Cup where no one knows;
But still the Vine her ancient Ruby yields,
And still a garden by the Water blows. V.
Come, fill the Cup, and in the Fire of Spring,
The Winter garment of repentence fling;
The Bird of Time has but a little way
To fly—and Lo; the Bird is on the wing. VII.
Here with a Loaf of Bread beneath the Bough,
A Flask of Wine, a Book of Verse—and Thou
beside me singing in the Wilderness—
and Wilderness is Paradise enow. XI.
Rubaiyat of Omar Khayyam.

Herodotus, the father of History, has some interesting remarks regarding the Persians.

"They are greatly given to wine."
Book I. 133. Herodotus translated by A. D. Godley.

"The Persians, for their equipment, wore on their heads loose caps called tiares (raised head-dress or high peaked cap of the Persians).
Book VIII 61, Herodotus translated by A. D. Godley.

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19 पाश्चात्यैरश्वसाधनैः Canto IV sl. 62.
शिरोभिः श्मश्रुलैर्महीं तस्तार Canto IV sl. 63.
अपनीत शिरस्त्राणाः शेषास्तं शरणं ययुः Canto IV sl. 64.
20 यवनीमुखपद्मानां सेहे मधुमदं न सः। Canto IV sl. 61.
21 विनयन्ते स्म तद्योधा मधुभिर्विजयश्रमं ।
आस्तीर्णाजिनरत्नासु द्राक्षावलयभूमिषु॥ Canto IV sl. 65.

22. Encylopaedia Brittanica.

Raghu next proceeds northwards, perhaps towards the Hindukush. There he is successful against the Huns who held sway over the territory through which flowed the Indus. The horses of Raghu are said to have rolled on the banks of the river and shook off the Kunkuma dust from their manes.[23] This reference shows us that the territory in question lies probably near Gilgit and the northern-most curve of the Indus. The Kambhojas are stated as offering presents of beautiful horses to Raghu. These people must have lived in the valleys near the Hindukush. Further the reference to Kunkumakesara which is obtainable only in Kashmir confirms the idea that Raghu must have gone towards the north of the Indus near the Hindukush.

He then enters the Himalayan region. Lions are mentioned as haunting the caves of this mountain. The soft breezes of the Ganges rustling among the dry leaves of the birch trees and producing noises in the bamboo bushes refresh him.[24] The stones there are said to be fragrant on account of the musk from the navel of the musk-deer.[25] Nameru and Sarala trees are plentiful. The medicinal herbs of the Himalayas are also mentioned.[26] Devadaru trees that grow plentiful in this region even to-day are stated to be profuse in those times. The inhabitants of this region happen to be the Kiratas (hunters). Here Raghu conquers one of the Hill tribes called the Utsavasankethas,[27] who are described in the Mahabharata as forming seven tribes.[28]

The victorious monarch is next seen crossing the Brahmaputra and proceeding towards Kamarupa, north of modern Assam, the capital of which is Pragjyotisha.[29] The lord of Kamarupa is spoken of as offering a tribute of elephants to the conqueror.[30] It must here be noted that elephants are even to-day

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23 विनीताध्वश्रमास्तस्य सिंधुतीर विचेष्टनैः ।
दुधुवुर्वाजिनः स्कन्धान् लग्नकुंकुमकेसरान्॥ Canto IV sl. 67.

24 भूर्जेषु मर्मरीभूताः कीचकध्वनिहेतवः ।
गङ्गाशीकरिणो मार्गेमरुतस्तं सिषेविरे । Canto IV sl. 73.

25 दृषदोवासितोत्सङ्गा निषण्णमृगनाभिभिः। Canto IV sl. 74.

26 आसन्नोषधयो नेतुर्नक्तमस्नेहदीपिकाः । Canto IV sl. 75.

27 शरैरुत्सवसंकेतान्स कृत्वा विरतो त्सवान् । Canto IV sl. 78.

28 गणानुत्सवसंकेता नजय त्सप्त पाण्डवः इति महाभारते
Caritra Vardhana a commentator of Raghuvamsa mentions this.

29 चकम्पे तीर्णलौहित्ये तस्मिन्प्राग्ज्योतिषेश्वरः। Canto IV sl. 81.

30 तमीशः कामरूपाणामत्याखण्डलविक्रमम् ।
भेजे भिन्नकटै र्नागैरन्यानुपरुरोध यैः ॥ Canto IV sl. 83.

found in plenty in the Brahmaputra valley. Kalidasa says that Kalagaru, a kind of black aloe tree is found in plenty in this region. This conquest finishes the expedition of Raghu who returns back to his capital as the Victor of the World.

The poet leaves out a number of kingdoms without allowing them to share the disgrace of defeat. These kings are described in eulogistic terms by Sunanda in the VIth canto. She first talks of Magadha and mentions Pushpapura as its capital.[31] Magadha is the same as modern South Bihar; and its chief city, very well-known as Pataliputra (modern Patna), is famous as the capital of the Mauryan Empire. The next kingdom to be mentioned is Anga. The people of this place are spoken of as experts in training elephants.[32] The kingdom of Anga with its old capital Champa or Kampa must be located near modern Bhagalpur and the Rajmahal Hills. The king of Avanti is next praised by Sunanda. Mahakala, a sacred place of Siva is mentioned as situated very near the capital of Avanti.[33] Rows of gardens are said to exist along the banks of the river Sipra flowing near by.[34] We hear more of this territory in the Megha-Duta where the poet describes it at length. Another kingdom is that of the Anupas. The river Reva or Narmada, charming on account of the curling ripples of water, and looking like a girdle of the ramparts of the city of Mahishmati, could well be seen from the windows of the king's palace.[35] The extent of the kingdom of Anupas is unknown but Mahishmati must have existed somewhere south of modern Jabbalpur on the banks of the Narmada. It formed part of the ancient kingdom of Chedi.

The next kingdom to be mentioned is that of the Surasenas. Here Kalidasa humourously tells us of how the Jumna that flowed in that region appeared white even before joining the waters of the Ganges because of the sandal on the breasts of the king's wives bathing in the river.[36] Brindavana is mentioned as very near the place. Sunanda requests Indumathi to be seated on the stone-slabs sprinkled with water-drops and fragrant with ben-

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31 प्रासादवातायनसंश्रितानां नेत्रोत्सवं पुष्पपुराङ्गनानाम्। Canto VI sl. 24.

32 विनीतनागः किल सूत्रकारै रैन्द्रं पदं भूमिगतोऽपि भुङ्क्ते। Canto VI sl. 27.

33 असौ महाकालनिकेतनस्य वसन्नदूरे किल चन्द्रमौलेः। Canto VI sl. 34.

34 सिप्रातरङ्गानिलकम्पितासु विहर्तुमुद्यानपरम्परासु। Canto VI sl. 35.

35 अस्याङ्कलक्ष्मीर्भव दीर्घबाहोर्माहिष्मतीवप्रनितम्बकाञ्चीम् ।
प्रासादजालैर्जलवेणिरम्यां रेवां यदि प्रेक्षितुमस्ति कामः॥ Canto VI sl. 43.

36 यस्यावरोधस्तनचन्दनानां प्रक्षालनाद्वारिविहारकाले ।
कलिन्दकन्या मथुरां गतापि गङ्गोर्मिसंसक्तजलेव भाति ॥ Canto VI sl. 48.

zoin and witness the dancing of the peacocks in the beautiful caves of the mountain Govardhana in the rainy season.[37] Mountain Govardhana and Brindavan are very close together. Even today the artists of the Rajput school in Muttra and Dwaraka represent the pictures of Govardhana and Brindavan as full of peacocks and monkeys since they are found there in large numbers.

Kalidasa talks of the king of Vidarbha as the lord of Krathakaisikas. They were usually called Bhojas. After following Aja some distance Bhoja is shown as returning to his capital, Kundina.[38] The Vidarbha territory goes by the name of 'Maharashtra' on account of its size. In the eighth canto the author refers to Gokarna as situated on the coast of the southern ocean.[39] This place is famous for its shrine.

In canto XIII Rama is seen pointing out the various scenes of his exploits to Sita. The first to be described is the Great Indian Ocean. Kalidasa holds that the form of the ocean, which is seen in various states, and which extends over the ten quarters by its great expanse, as undefinable in its nature and measure as the form of Vishnu.[40] The ebb and flow of the sea is humourously described by the poet as its drinking the waters of the river and making them drink its own.[41] He gives also a graphic account of the whale taking in the water containing fishes and other aquatic animals and letting out streams of water through a hole on its head with its jaws closed.[42] He also talks of crocodiles and serpents; shoals of conch shells are described as being dashed by the waves against red coral reefs.[43] Whirlpools are also spoken of. The coast of South India is described as dark with tamala and palm trees.[44] The beach further north is described as scattered with pearls fallen out from the shells and abounding in

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37 अध्यास्य चाम्भःपृषतोक्षितानि शैलेयगन्धीनि शिलातलानि ।
कलापिनां प्रावृषि पश्य नृत्यं कान्तासु गोवर्धनकन्दरासु॥ Canto VI sl. 51.
38 तस्मादुपावर्तत कुण्डिनेशः Canto VI sl. 33.
39 अथ रोधसि दक्षिणोदधेः श्रितगोकर्णनिकेतमीश्वरम्। Canto VI sl. 33.
40 तां तामवस्थां प्रतिपद्यमानं स्थितं दश व्याप्य दिशो महिम्ना ।
विष्णोरिवास्यानवधारणीयमीदृक्तया रूपमियत्तया वा॥ Canto XIII sl. 5.
41 अनन्यसामान्यकलत्रवृत्तिःपिबत्यसौपाययते च सिन्धुः। Canto XIII sl. 9.
42 ससत्वमादाय नदीमुखाम्भः संमीलयन्तो विवृताननत्वात् ।
अमी शिरोभिस्तिमयःसरन्ध्रैरूर्ध्वंवितन्वन्ति जलप्रवाहान्॥ Can. XIII sl. 10.
43 तवाधरस्पर्धिषु विद्रुमेषु पर्यस्तमेतत्सहसोर्मिवेगात् ।
ऊर्ध्वाङ्कुरप्रोतमुखं कथंचित्क्लेशादपक्रामति शङ्खयूथम् ॥ Canto XIII sl. 13.
44 तमालतालीवनराजिनीला आभाति वेला Can. XIII sl. 15.

rows of betelnut trees full of fruits.[45] As the sea becomes more and more indistinct the forests of the Deccan come into view. Then comes the Janasthana. Malyavan with its lofty peak is situated there.[46] Pampa lake with canes growing on its banks and frequented by Sarasa birds is also mentioned.[47] These places are even to-day to be seen near the ruins of Hampi. The famous Rishyamuka mountain is not far off from the Pampa lake. Further north we go to the Godavari with Panchavati in its vicinity.[48] The banks of the river Godavari are said to abound in arbours of reeds. Panchavati is identified with modern Nasik on the Godavari near Khandesh. The lake Pancapsaras which Rama points out is unidentified. Going past several hermitages we come to Chitrakuta with the mouths of its caves resounding with the noise of rivulets.[49] This mountain is even to-day frequented by pilgrims and is situated in Banda district of the Allahabad division. In the distance is to be seen the Ganges which is described at some length. The stream of the Ganges with its current broken by the waves of the Jumna appears in one place like a necklace of pearls interspersed with emeralds, at another place like a garland of white lotuses interwoven with blue ones. In one place it appears like the white swans of the Manasa lake coming in contact with black ones. In another it appears like a ground smeared with sandal and ornamented with designs in black sandal paste. At one place it appears like the light of the moon variegated by the darkness lying in the shade; at another it looks like a white streak of the autumnal cloud through the openings of which could be seen the surface of the sky. Elsewhere it appears like the body of Siva annointed with ashes and adorned with black snakes.[50] This beautiful description of the Ganges

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45 एते वयं सैकतभिन्नशुक्तिपर्यस्तमुक्तापटलं पयोधेः
प्राप्ता मुहूर्तेन विमानवेगात्कूलं फलावर्जितपूगमालम् ॥ Canto XIII sl. 17.
46 एतद्गिरेर्माल्यवतः पुरस्तादाविर्भवत्यम्बरलेखिशृङ्गम्। Canto XIII sl. 26.
47 उपान्तवानीरवनोपगूढान्यालक्ष्यपारिप्लवसारसानि ।
दूरावतीर्णा पिबतीव खेदादमूनि पम्पासलिलानि दृष्टिः॥ Canto XIII sl. 30.
48 आह्लादयत्युन्मुखकृष्णसारा दृष्टा चिरात्पञ्चवटी मनो मे। Can. XIII sl. 34.
49 धारास्वनोद्गारि दरीमुखोऽसौ Can. XIII sl. 47.
50 क्वचित्प्रभालेपिभिरिन्द्रनीलैर्मुक्तामयी यष्टिरिवानुविद्धा ।
अन्यत्र माला सितपङ्कजानामिन्दीवरैरुत्खचितान्तरेव ॥
क्वचित्खगानां प्रियमानसानां कादम्बसंसर्गवतीव पङ्क्तिः ।
अन्यत्र कालागुरुदत्तपत्रा भक्तिर्भुवश्चन्दनकल्पितेव ॥
क्वचित्प्रभा चान्द्रमसी तमोभिश्छायाविलीनैः शबलीकृतेव ।
अन्यत्र शुभ्रा शरदभ्रलेखा रन्ध्रेष्विवालक्ष्यनभःप्रदेशा ॥
क्वचिच्च कृष्णोरगभूषणेव भस्माङ्गरागा तनुरीश्वरस्य ।
पश्यानवद्याङ्गि विभाति गङ्गा भिन्नप्रवाहा यमुनातरङ्गैः॥ Canto XIII sl. 54-57,

at its meeting-place with Yamuna is one of the finest specimens of Kalidasa's imagination. In the XVIth canto Kusa is seen bowing to the Ganges whose water was tremulous by the motion of ships.[51] In the XIVth canto the river Sarayu is described as full of sailing ships.[52] Sarayu is modern Gogra, and it is a fairly big tributary of the Ganges. Rama tells Sita that he honours the river as a common nurse of the princes of Uttarakosala, who were familiar with the pleasure of moving on her lap of sands and were nourished by the abundance of her milk-like water.[53] The river, Rama thinks, tries to embrace him with her arms of waves.[54] The kings of the Ikshvaku line ruled over Uttarakosala which lay between the Ganges and the Gogra. The kingdom of Dakshinakosala formed the territory of the modern Central Provinces.

In canto XV Satrughna is spoken of as the founder of Mathura on the banks of the Yamuna.[55] The dark Yamuna with golden flamingoes is picturesquely described.[56] Kalidasa speaks in this canto of how Bharata conquered the Gandharvas who lived in the Punjab or the land of the Sindhu. The poet takes a practical view of things and holds that the Gandharvas were no special inhabitants of the sky but were only the people of Sindhudesa. The ancient capitals of the Sindhu country are described by the poet as named after the sons of Bharata, Taksha and Pushkala.[57] Taksha is Takshasila, Pushkala might be the modern Pushkara near Ajmere. But then it is far away from the Indus. Pushkala is called Pushkalavati and might even be Peshawar. Lakshmana's sons get the country called Karapatha. This country is unidentified. Kusa and Lava get Kusavati and Saravati. Kusavati is also called Kusasthali and formed the capital of Dakshina-Kosala. It is probably the same as Ramnagar in Bundelkhand. The sacred spot Gopratara mentioned by Kalidasa about

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51 सुरालयप्राप्तिनिमित्तमम्भस्त्रैस्रोतसं नौलुलितंववन्दे॥Canto XVI sl. 34.

52 विगाह्यमानां सरयूं च नौभिः। Canto XIV sl. 30.

53 यां सैकतोत्सङ्गसुखोचितानां प्राज्यैः पयोभिः परिवर्धितानाम्।
सामान्यधात्रीमिवमानसंमेसंभावयत्युत्तरकोसलानाम्। Canto XIII sl. 62.

54 तरङ्गहस्तैरुपगूहतीव Canto XIV sl. 63.

55 उपकूलं स कालिन्द्याः पुरीं पौरुषभूषणः।
निर्ममे निर्ममोऽर्थेषु मथुरां मधुराकृतिः॥ Canto XV sl. 28.

56 तत्र सौधगतः पश्यन्यमुनां चक्रवाकिनीम्।
हेमभक्तिमतीं भूमेः प्रवेणीमिव पिप्रिये॥ Canto XV sl. 30.

57 स तक्षपुष्कलौ पुत्रौ राजधान्योस्तदाख्ययोः।
अभिषिच्याभिषेकार्हौ रामान्तिकमुपागत : Canto XV sl. 89.

the end of the XVth canto cannot be identified.[58] It might be some part of the Sarayu very near Ayodhya. Perhaps Gogra is an unhappy contraction of the name Gopratara.

In the XVIth canto we see Kusa travelling from Kusavati to Ayodhya. The army looking far away in the valleys of Vindhya mountain, being divided into many squadrons, made the mouths of the caves echo with its roar just like the noisy Narmada.[59] Kalidasa when describing the Reva always says that her waters are spread and scattered in the Vindhya valleys. In the Meghaduta he says that Reva is scattered over the rugged rocks at the foot of the Vindhyas.[60] Even to-day the sight is very picturesque and the poet is quite faithful in his description. The country around abounds in red minerals and naturally the rims of the chariot wheels get red.[61] The hill tribes known as Pulindas are described as living there. Then comes the Ganges and lastly Sarayu on the banks of which is Ayodhya.

In the Meghaduta we see the sorrowful Yaksha requesting a cloud to carry tidings of his welfare to his spouse in Alaka and gives out a detailed account of the route to be taken to reach his home. The Ramagiri that Kalidasa mentions must be the mountain Ramteka near Nagpur. It cannot be Ramgarh near Amarkantak since Kalidasa locates Ramagiri south of Amarkantak (Amrakuta) which condition Ramgarh does not satisfy. The Yaksha asks the cloud to go north from Ramagiri.[62] After reaching Malakshetra sweet-smelling by the ploughing of the fields, and being looked at with joy by the country-women who knew how important a cause it was for a good crop, the cloud should travel a bit west and again go north.[63] This Mala might either

58 यद्गोप्रतरकल्पोऽभूत्सम्मर्दस्तत्र मज्जताम् ।
अतस्तदाख्यया तीर्थं पावनं भुवि पप्रथे ॥Canto XV sl. 101.

59 मार्गैषिणी सा कटकान्तरेषु वैन्ध्येषु सेना बहुधा विभिन्ना।
चकार रेवेव महाविरावा बद्धप्रतिश्रुन्तिगुहामुखानि॥Canto XVI sl. 31.

60 रेवां द्रक्ष्यस्युपलविषमे विंध्यपादे विशीर्णां Me. Canto I sl. 19.

61 स धातुभेदारुणयाननेमि : Canto XVI sl. 32.

62 स्थानादस्मात्सरसनिचुलादुत्पतोदङ्मुखः खम् Me. Canto I sl. 14.

63 त्वय्यायत्तं कृषिफलमिति भ्रूविकारानभिज्ञैः
प्रीतिस्निग्धैर्जनपदवधूलोचनैः पीयमानः ।
सद्यः सीरोत्कषणसुरभिक्षेत्रमारुह्य मालं
किंचित्पश्चाद्व्रज लघुगतिर्भूय एवोत्तरेण ॥ Me. Canto I sl. 16.

be a place-name or an elevated ground.[64] If it means the former we can only say that the site where it stood is unidentified. Wilson holds that there is a certain Malda a little to the north of Ruttunpur. But then this is a mere conjecture, and Ruttunpur lies very far away to the north-east of Nagpur. If it is Mandla, then we can't understand why the cloud should go a bit to the west and then north.

Then the Amrakuta is mentioned as a resting place for the cloud. The slopes of this mountain are described as completely covered with mango trees burdened with fruits.[65] Having rested for some time on that mountain the caves of which were inhabited by hill-tribes[66] the cloud should continue the journey and sight Reva or Narmada with its waters spread all over the rugged and rocky valley of the Vindyhas.[67] The waters of this river are described as smelling of the rut of wild elephants while the current is obstructed by bowers of Jambu.[68] To-day the Vindhya mountain and the forests about it near the Narmada are not famous for their elephants. The forests near Narmada are said to abound in Kadamba trees and wild plantains.

Going still further we come to Dasarna, with its garden hedges white with Ketaka flowers, boisterous on account of the noise of crows busy building nests on the village way-side trees and beautiful with Jambu groves.[69] Dasarna formed the eastern part of Malavadesa and its capital Vidisa,[70] modern Bhilsa, stood on the river Vetravati, modern Betwa. It cannot be as Wilson holds that Dasarna formed at least in part the modern district of Chhatisgarh which is the eastern end of the Central Provinces. Further it is south of Amrakantak and the route of the cloud

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64 मालं मालाख्यं क्षेत्रं शैलप्रायमुन्नतस्थलं,
मालमुन्नतभूतलमित्युत्पलमालायाम्—Mallinatha.

65 छन्नोपान्तःपरिणतफलद्योतिभिः काननाम्रैः Me. Canto I sl. 18.

66 स्थित्वा तस्मिन्वनचरवधूभुक्तकुञ्जे मुहूर्तम् Me. Canto I sl. 19.

67 रेवां द्रक्ष्यस्युपलविषमे विन्ध्यपादे विशीर्णां Me. Canto I sl. 19.

68 तस्यास्तिक्तैर्वनगजमदैर्वासितं वान्तवृष्टि
र्जम्बूकुञ्जप्रतिहतरयं तोयमादाय गच्छेः। Me. Canto I sl. 20.

69 पाण्डुच्छायोपवनवृतयः केतकैः सूचिभिन्नै
र्नीडारम्भैर्गृहबलिभुजामाकुलग्रामचैत्याः॥
त्वय्यासन्ने परिणतफलश्यामजम्बूवनान्ताः
सम्पत्स्यन्ते कतिपयदिनस्थायिहंसा दशार्णाः ॥Me. Canto I sl. 23.

70 तेषां दिक्षु प्रथितविदिशालक्षणां राजधानीं । Me. Canto I sl. 24.

would suffer if we locate Dasarna here. It is very near Orissa and might have formed the boundary of Dakshina Kosala. Dasarna might have formed the territory lying between modern Bhopal and Jubbalpur. Near Vidisa is mentioned a hill called Nichaih.[71] This might be the hill five miles off from Bhilsa on which stands the Sanchi tope one of the most famous of Buddhist relics in India. Peculiar jasmine plants are described as growing in the gardens on the banks of the forest streams near the hill.[72] Wilson takes Vananadi (forest stream) as Naganadi, to mean the river Parbatty which falls into the Chambal. The Parbatty does not join the river Sipra as Wilson puts it.

Though Ujjain is rather out of the way the Yaksha asks the cloud not to miss it since it is worth a visit.[73] Kalidasa is very eloquent in talking of this city which was perhaps one of the finest in India of his time. There is described a turbulent rivulet called Nirvindhya containing a good many whirlpools.[74] The rich and large city of Ujjain is stated as situated in the country called Avanti. The people of this place are familiar with the stories of Udayana.[75] Near Ujjain runs the Sipra river wafting cool breezes fragrant with *opening lotus buds in the mornings.*[76] Next comes an exaggerated description of the wealth of the city. The account of the mansions of Ujjain given by Kalidasa in sloka 32 shows what a highly refined people lived there in his days.[77] The

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71 नीचैराख्यं गिरिमधिवसेस्तत्र विश्रामहेतोः Me. Canto I sl. 25.

72 विश्रान्तस्सन्व्रज वननदीतीरजातानि सिञ्चन्
उद्यानानां नवजलकणैर्यूथिकाजालकानि ॥Me. Canto I sl. 26.

73 वक्रः पन्था यदपि भवतः प्रस्थितस्योत्तराशां
सौधोत्सङ्गप्रणयविमुखो मास्मभूरुज्जयिन्याः Me. Canto I sl. 27.

74 वीचिक्षोभस्तनितविहगश्रेणिकाञ्चीगुणायाः
संसर्पन्त्याः स्खलितसुभगं दर्शितावर्तनाभेः ।
निर्विन्ध्यायाःपथिभवरसाभ्यन्तरःसंनिपत्य Me. Canto I sl. 28.

75 प्राप्यावन्तीनुदयनकथाकोविदग्रामवृद्धान्
पूर्वोद्दिष्टामनुसरपुरींश्रीविशालांविशालाम्। Me Canto I sl. 30.

76 प्रत्यूषेषु स्फुटितकमलामोदमैत्रीकषायः
यत्र स्त्रीणां हरति सुरतग्लानिमङ्गानुकूलः
शिप्रावातः प्रियतम इवप्रार्थनाचाटुकारः Me. Canto I sl. 31.

77 जालोद्गीर्णै रुपचितवपुः केशसंस्कारधूपैः
बन्धुप्रीत्या भवनशिखिभिर्दत्तनृत्योपहारः ।
हर्म्येष्वस्याः कुसुमसुरभिष्वध्वखेदं नयेथाः
पश्यन्लक्ष्मींललितवनितापादरागाङ्कितेषु॥Me. Canto I sl. 32.

Candisvara (*Siva*) *that* is mentioned in verse 33 is Mahakala whose temple is situated very near Ujjain and ranks as a premier pilgrims' resort. The poet mentions the name Mahakala in the very next verse. The river Gandhavati referred to in verse 33 is perhaps a small local stream. The river Gambhira mentioned next in the cloud's route is perhaps another insignificant brook. The next place of interest is Devagiri. Wild figs are described as plentiful in this forest region wherein elephants roam freely.[78] The hill Devagiri is the sacred spot of Kartikeya.[79] This hill is not yet located. It cannot be Deogarh in the Udaipur State since it lies quite out of the way. The cloud *has next to go to Carmanvati river. This river got that peculiar* name since it was produced by the great flow of blood of the sacrificial cows slain by king Rantideva.[80] This river is modern Chambal. Very near Carmanvati is situated Dasapura,[81] which *might be modern Dholpur. It was the ancient capital of Rantideva.*

The territory next to be covered by the cloud is Brahmavarta in which is situated Kurushetra the battle-field where Arjuna killed so many warriors.[82] The commentator Mallinatha explains Brahmavarta as that portion of land which lies between the rivers Saraswati and Drishadvati. Next the cloud has to go to the Ganges descending from the Himalayas near Kanakhala.[83] Kanakhala is explained by Wilson by quoting a verse from Gan-

78 त्वन्निष्यन्दोच्छ्वसितवसुधागन्धसंपर्करम्यः
स्रोतोरन्ध्रध्वनितसुभगं दन्तिभिः पीयमानः ।
नीचैर्वास्यत्युपजिगमिषोर्देवपूर्वं गिरिं ते
शीतो वातःपरिणमयिताकाननोदुम्बराणाम्॥Me. Canto I sl. 42.

79 तत्र स्कंदं नियतवसतिं पुष्पमेघीकृतात्मा
पुष्पासारैः स्नपयतु भवान्व्योमगङ्गाजलार्द्रैः:Me. Canto I sl. 43.

80 व्यालम्बेथाः सुरभितनयालम्भजां मानयिष्यन्
स्रोतोमूर्त्या भुवि परिणतां रन्तिदेवस्य कीर्तिम्॥Me. Canto I sl. 45.

81 कुन्दक्षेपानुगमधुकर श्रीमुषामात्मबिंबं
पात्रीकुर्वन्दशपुरवधूनेत्रकौतूहलानाम् Me. Canto I sl. 47.

82 ब्रह्मावर्तं जनपदमथ छायया गाहमानः
क्षेत्रं क्षत्रप्रधनपिशुनं कौरवं तद्भजेथाः ।
राजन्यानां शितशरशतैर्यत्र गाण्डीवधन्वा
धारापातैस्त्वमिव कमलान्यभ्यवर्षन्मुखानि ॥ Me. Canto I sl. 48.

83 तस्माद्गच्छेरनुकनखलं शैलराजावतीर्णां
जन्होः कन्यां सगरतनयस्वर्गसोपानपङ्क्तिम् Me. Canto I sl. 50.

gadvara Mahatmya.[84] The verse explains how even rogues get purified by bathing in the Ganges and is a comment on 'Ka (Kah) na Khalah'. This is the name of the holy place where the Ganges descends into the low ground.

Again we get a description of the Himalayas with its stones perfumed by musk-deer,[85] possessing Sarala trees that produced forest fires by constant friction of their trunks.[86] The bamboo bushes are spoken of as singing in the wind. This singing of the bamboos is referred to in Raghuvamsa and Kumarasambhava.[87] Very near the Himalayas, that appeared like the heap of Siva's laughter (on account of its whiteness due to snow),[88] there is Hamsadvara, i.e., the path of swans which is the cave of Kraunca.[89] Hardwar is the place where the Ganges enters the plains and is even to-day a sacred spot. It might be the Hamsadvara that Kalidasa refers to. Going still further north we come to Mount Kailas.[90] Alaka is said to be situated on the slopes of Mount Kailas and the sighting of this town brings the journey of the cloud to a close.

Kalidasa has tried to give us in these two works of his an amount of knowledge in Geography that can be easily got without a bothering study of an insipid text-book. Regarding his flora and fauna there is much to be said which cannot be put within the short compass of this resume. The one thing that forms a special attraction in studying Kalidasa from a Geographer's point of view is the striking accuracy of his statements, the exactness of his topography and the sweet manner in which he puts things.

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84 खलः को नाम मुक्ति वै भजते तत्र मज्जनात् ।
अतः कनखलं तीर्थं नाम्ना चक्रुर्मुनीश्वराः ॥
85 आसीनानां सुरभितशिलं नाभिगन्धैर्मृगाणाम् Me. Canto I sl. 52.
86 तं चेद्वायौ सरति सरलस्कंधसंघट्टजन्मा
बाधेतोल्काक्षपितचमरीवालभारो दवाग्निः ।Me. Canto I sl. 53.
87 शब्दायन्ते मधुरमनिलैः कीचकाः पूर्यमाणाः Me. Canto I sl. 56.
सकीचकैर्मारुतपूर्णरन्ध्रैः कूजद्भिरापादितवंशकृत्यम् Rag. can. II sl. 12.
यः पूरयन्कीचकरंध्रभागान्दरीमुखोत्थेन समीरणेन ।
उद्गास्यतामिच्छतिकिन्नराणांतानोपदायित्वमिवोपगन्तुम् Ku. Can. I sl. 8.
88 राशीभूतः प्रतिदिनमिव त्र्यम्बकस्याट्टहासः Me. Canto I sl. 58.
89 प्रालेयाद्रेरुपतटमतिक्रम्य तांस्तान्विशेषान्
हंसद्वारं भृगुपतियशो वर्त्मयत्क्रौञ्चरन्ध्रं । Me. Canto I sl. 57.
90 कैलासस्य त्रिदशवनितादर्पणस्यातिथिः स्याः Me. Canto I sl. 58.

Localisation of Industry in India

By

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In these days of rapid economic transition when old centres of industry and trade find their supremacy challenged and threatened by the rise of younger and more enterprising rivals, it may not be a profitless task to enquire how far the conditions that had in the past favoured these localities were really fundamental and how far only accidental. We are witnessing to-day nearly all the world over an unmistakable drift of industry from well-known centres to other regions within the country and abroad. Thus in Great Britain the centre of industrial life is shifting from the north to the south and Lancashire is yielding place to other centres of the world as cotton manufacturing areas. We find the same tendency in evidence in the U. S. A. where the cotton industry is migrating from the north to the south. In our own country Bombay is fast ceasing to occupy that predominant position in the cotton industry which it once held and up-country centres are growing up which will soon overthrow its supremacy. There is also a growing feeling that the advantages of local concentration of industry have been overrated and that, on the whole, it is desirable to secure for each country a more equal geographical distribution of industrial life. The breaking down of local concentration, the relative decline of the highly developed areas and the development of backward areas, all of which are in evidence in U. S. A. are welcomed by thoughtful men as a distinctly progressive economic trend. No one who is aware of the extraordinarily grave social problems that the concentration of industry in Calcutta and Bombay has given rise to will have any doubt that anything that breaks down this excessive specialisation and promotes industrial life in other less congested centres must be wholly welcomed. Even from the narrow economic point of view it is felt that exclusive specialisation and excessive dependence on one or two industries carry with them great dangers to the prosperity of those centres, although it has needed a prolonged period of industrial depression to carry conviction.

That Bombay and Lancashire, for example, have been greatly handicapped in readapting themselves to changed circumstances

owing to their excessive dependence upon single types of livelihood is now too well-known to be stressed. Diversification of industry means less violent depressions and perhaps less excited booms too since the various industries do not all move in exact degree. A radical change in ideas and outlook has recently come over all thinking people in regard to the problem of localisation which it would be well to take note of. We should therefore perhaps prefer that a centre like Tatanagar would cluster round itself a large number of miscellaneous and subsidiary industries lest a depression in the steel trade should bring utter ruin to the whole town.

It seems to me that at the present moment a study of the various factors that affect the localisation of industry in India will possess unique value and interest for more reasons than one. We are on the eve of an important period of industrial expansion and the acceptance of a policy of protection to new industries makes it all the more imperative that any industry that seeks to expand behind tariff walls should be suitably located in reference to the primary geographical factors. Too often in the past it was readily believed that because an industry had come to be concentrated in a particular area, that centre was the most ideal location for it. How much did it owe its predominant position to chance or other accidental factors and how much to its geographical and natural advantages were not adequately considered. If the history of several industries of the world were examined it would be found that personal factors, the pioneering enterprise of an individual or a class have had as much to do with their location as physical and geographical factors. How much Bombay owes its position to the enterprising spirit of the Parsi community is known to everyone. It has been said for instance that Philadelphia became famous for locomotive works because one Baldwin on seeing a locomotive imported from England decided that he would do it himself there. Nor is it to be supposed that because a certain locality had natural advantages other centres had not similar or even better advantages. An initial handicap like lack of adequate and easy communications might prevent one centre from rising into prominence but as soon as that handicap is removed it might easily supplant all its rivals.

A certain amount of careful and scientific selection of centres of industrial activity seems to be particularly called for, in India, as, owing to the inexperience of Indian industrialists, mistakes and wastes of wrong localisation have occurred. In certain conceivable circumstances some measure of publicly controlled localisation might even be desirable as otherwise industries are likely to be

located in places where there is insufficient scope for the fullest utilisation of labour. Cases often occur where only female or male labour is utilised and a large supply of one kind remains untapped or drawn into employments with very low remuneration to the detriment of industrial progress and of general efficiency. Haphazard methods of choosing sites must therefore be replaced by deliberate and carefully worked out plans for the future development of industrial localities. To this end Government might contribute not a little by guidance and advice. One reason why expert assistance should be placed at the disposal of industrial pioneers is that in India owing to the concentration of all the best coal deposits in a single locality the problem of localisation resolves itself on the one hand into choosing places near the coal areas and on the other into a nicely balanced set of considerations too difficult to decide. The availability of other raw materials and access to markets are factors tending to locate industries away from the coal areas. These difficulties will be illustrated as we study the location of industries like paper, cement and certain chemical industries.

II

OLD INDIAN HANDICRAFTS.

The factors that led to the localisation of industries in India upto the end of the 18th century and the middle of the 19th were fairly clear and definite. The simple articles needed to clothe and house the population and to supply them with tools were widely scattered over the country and were sufficient to meet local needs.. But there was some degree of localisation in the manufacture of specialities and luxuries for export and for consumption at the large urban centres. While some of these towns had a diversified industrial activity, there were others which became famous as centres of certain specialised industrial products. The patronage of courts, the concentration of population in towns providing a market for goods and the traditional skill of the workers, were the chief determining factors in those days. The inherited skill of the carpet weavers of Kashmir, of the marble laying workers of Agra, of the muslin weavers of Dacca have not a little to do with the prosperity of those urban centres.

FACTORY INDUSTRIES: PRIMARY FACTORS.

It is, however, with the growth of the modern factory industries in India that the somewhat complex considerations affecting localisation of industries come into play. By localisation we mean

the concentration of different industries in different localities, a phenomenon which in its international aspect is usually termed as territorial division of labour. But it is best studied from a national aspect for there alone physical factors are allowed free scope and not impeded by those elements of economic friction, such as national prejudice, tariffs and other legislative restraints. The manufacturing industries result from a combination of conditions largely geographic in their origin and depend for their success upon such natural advantages as raw material, labour, market, power, etc. The 12th census of the U. S. A. has summarised the main causes of localisation in these terms:—Nearness to materials, nearness to markets; water power, favourable climate, supply of labour, capital available for investment in manufactures, and the momentum of an early start. All these advantages except the last prescribed the broad area within which an industry is economically possible. Usually that centre will ultimately attain preeminence which can count the largest number of these desirable primary factors. Sometimes, the choice can only be made after a study of the net effects of these various factors, some of which will tend in one direction and others in another.

It is necessary to bear in mind that nearness to material and nearness to markets mean more than geographical distance and are largely a matter of costs. Further with reference to the ideal location in regard to raw material the test is not the cost of a unit of material but the material cost of a unit of completed product. Moreover, the progress of industrial invention is perpetually changing the economic import of physical conditions. Everyone knows how the iron industry which was first located near the forests and water-power had to shift to the coal areas when coal took the place of wood as fuel and steam power replaced water power. At every period similar technical changes are occurring which completely change the relative significance of the various elements that affect localisation. Each industry has its location determined by the dominant force of either raw material, or power or of market or of labour either singly or in combination. The extent to which each of these factors determines the location of the different industries will become evident when we take up some industries for detailed consideration.

UNEVEN DISTRIBUTION OF INDUSTRIES IN INDIA.

The most striking feature about the distribution of industries in India is its extraordinary unevenness. Industrial enterprise is concentrated in and around Calcutta, Bombay and a few other

towns. In Calcutta and in the three districts next to it, Howra, Hoogly and 24 Parganas, the factory population is well over 450,000. Bombay city and Island has about 190,000 workers so that these two small areas account for more than half the workers of India. With the exception of Ahmedabad where there are nearly 70,000 workers, there is no centre with as many as 30,000 permanent workers. When a few secondary centres with a definite concentration of industries are mentioned like Cawnpore, Jamshedpur, Madras and Rangoon, one has nearly exhausted the list of industrial centres. The two staple trades, cotton and jute, are located mostly in Bombay and Calcutta respectively. The explanation for this high concentration of industry in these two centres lies in the fact that in the past the position of most of the large scale industries has been determined primarily by transport facilities. Calcutta and Bombay are not only great ports but junctions of railways. They have been favoured by the presence of enterprising merchants and traders, the Scotchmen in Calcutta and the Parsis in Bombay. Besides the advantages that Calcutta enjoys in common with Bombay, it possesses certain exceptional facilities such as cheap water transport and proximity to coal and jute. But with the improvement of transport facilities, other centres are springing up which find that as their initial handicaps and inequalities are being removed they could also successfully establish certain forms of industrial enterprise. Within the last 15 years some progress has been made in industrial activities. The establishment of paper and match industries, the rise of the chemical industries and the expansion in the development of industries like cement, sugar and the growth of the steel industry have not only created new centres of activity but afforded peculiar interest to the problems of industrial location. We shall perhaps best get some insight into them by taking certain individual industries for more detailed consideration.

III

THE COTTON INDUSTRY.

The cotton industry affords striking illustration of the truth of the statement that the availability of raw material in a certain country or centre is no reason why we should expect the industry to flourish therein. Neither Lancashire nor Japan grows any cotton and yet they have been great world centres of production of cotton goods. In the U. S. A. while the Southern States grow cotton, the manufacturing had been carried on until recently almost exclusively in the north. While there is a very wide dis-

tribution of raw cotton in India and while cotton ginning and pressing factories lie scattered all over the country in Bombay, Central Provinces, Madras, Punjab, United Provinces, Ajmere Merwara etc., the manufacturing industry itself is located principally in 3 or 4 centres in the Bombay Presidency. Out of 295 cotton spinning and weaving mills in 1929, 203 mills are located in the Bombay Presidency and of these Bombay and Ahmedabad together possess 174 mills; the other centres being Sholapur, Surat and Broach. By the side of Bombay or Ahmedabad, the other cotton centres pale into insignificance; there are about 21 in Madras Presidency, particularly in Madras City and Coimbatore, about 22 in United Provinces of which Cawnpore accounts for 10 and about 15 in Central Provinces with Nagpur and Wardha as leading centres. There are vast cotton growing tracts with no cotton spinning and weaving factory and some explanation is apparently called for this lack of correlation between sources of raw material and places of manufacture. In the first place, it may be noted that in textile industries generally the cost of transportation is so little that raw material and finished products can go very great distances with very little addition to total cost. It costs no more to bring cotton from Galveston to Lancashire than to take it to the chief manufacturing areas in the U. S. A. Japan is able to take cotton from India at nearly the same cost as Bombay mills because of the exceptionally cheap ocean freights. Secondly, there is no great difference in weight between the raw material and finished product made from it so that there is no compelling motive to manufacture the cotton in the producing centres which are less favourably situated in other respects. In general, it may be said that raw materials tend to attach industries to their place of production in inverse proportion to the amount of the raw material that enters into the finished product. A raw material that enters wholly into the manufactured product without leaving any waste can in itself exercise very little influence in planting an industry where the raw material is found. Conversely, the presence of a raw material of which a large proportion is waste has a tendency to attract an industry to the material. Thus the saw mill, the wood pulp manufacture, copra and other industries must necessarily be located near the place of material whereas there is not the same need to economise in freight as in the case of the textile industry. Thirdly, the advantages of reliability of supply and of a wide assortment from which to select are so great that a factory will prosper better in a great marketing centre than in the region of original supply. The grading of cotton so essential to secure uniformity in spinning is done in big markets like Liverpool or Bombay and not in

up-country cotton growing areas. Efficient labour seems to have been a major factor in the location of the industry.

There is no doubt that Bombay owed its dominant position in respect of the cotton industry on account of its excellent shipping and railway facilities and the business enterprise of the merchants and Managing Agents. Railway freights also favoured Bombay.* If Punjab cotton was sent to Bombay to be woven into cotton goods and to be returned back to the Punjab, it was because of the cheap railway rates for goods moving from and to the great port. That the policy of the railways is a determining factor of industrial location will readily be seen when one realises that whether an industry should be located near the material or near the market is more or less decided by the respective rates on raw material and manufactured product. Not very long ago, the Punjab wheat was sent to the Calcutta flour mills and returned as flour back to the Punjab; but now most of the Punjab wheat is milled into flour locally. In all this the relative freights on raw material and finished products come into play. If the rate on raw material is low, the remoter area will be favoured; if it is high, manufacture will take place near the source of the material. No one can deny that the cheap railway rates for goods moving to and from Bombay and other ports were an important factor that led to concentration of industry in those ports.

RISE OF MILLS IN UP-COUNTRY CENTRES.

And yet it cannot be doubted that since 1920 a change of great significance has occured and the cotton industry is getting more widely scattered all over the country. Since 1921, when there was a decrease of 4 in the number of mills in Bombay, there was an increase of 34 in the number of mills working in up-country centres in 1925 and since then a large number of mills (about 45) have been newly started, particularly in Madras and Bengal. This drift of industry is found not only in India but in other countries like the U. S. A. where the Southern States have seriously begun to undertake the manufacturing of cotton. It is then clear that the effects of the old forces of localisation are fast wearing themselves out and new factors seem to exert considerable influence in the location of the cotton industry. So far as India is concerned it can be said that up-country centres want to take advantage of their nearness to markets. They also have an advantage in the production of that particular kind of cloth for which this cotton is suited. Science is rapidly improving the quality of the raw material and to this extent the cotton tracts are gaining ground. Further labour is both plentiful and cheap if a little inefficient. On

the other hand, an old centre like Bombay suffers from excessive labour cost; wages have been far too high; but owing to the high cost of living cannot be reduced either. The high cost of land, the burden of high local taxation, foreign competition at the port and the high cost of fuel are placing Bombay relatively at a disadvantage. One might venture to state that within the next 30 or 40 years Bombay will have ceased to be the main centre of India's cotton industry, which will distribute itself more evenly in the country. In any case in the production of the commoner varieties of cloth, nearness to the raw material and the local market must place a locality at sure advantage over others far removed from either.

The advantage that climate confers on centres like Lancashire is real and there is no doubt that the high efficiency of cotton spinning in Lancashire is partly the result of its humidity. But science is eliminating such inequalities between one centre and another and artificial humidification is possible, though not always satisfactory. The influence of climate is more pronounced in the case of the steel industry where the difference between temperate and tropical regions causes an appreciable difference in productive efficiency.

THE JUTE INDUSTRY.

The jute industry seems, however, to be an exception to the general theory of location of the textile industries. It is a cheap raw material and cannot therefore afford much transportation cost. Bengal is the world's jute producing centre and its position is not likely to be challenged except under very extraordinary circumstances, for no other place affords such exceptional facilities for the growing of jute. "It is in the great stretches of fertile land in Bengal where clay and sand are mixed with decayed vegetable matter and where the overflow of the rivers leaves deposits which renew the soil year by year that the world's jute fields lie." The raw material is transported very cheaply by the many waterways with which Bengal abounds and thus in every way the unique and unrivalled position of that province continues to be maintained. Of the 95 jute factories in India, nearly all of them with the exception of 4 which are in the Madras Presidency, where a fibre (Bimilipatam jute) differing from the true jute is grown and one in Bihar, are in Bengal and even there lie in a small strip of country about 60 miles long and 2 miles broad along both banks of the Hoogly above and below Calcutta. There is, therefore, a great concentration of the industry in and around Calcutta and it is not

likely that Calcutta's position will even be seriously threatened. The jute industry with its 95 mills employs slightly more workers than the cotton industry with its 295 mills and raises very grave social problems of overcrowding, sex disparity and so on.

THE SUGAR INDUSTRY.

Unlike that of the cotton industry the location of sugar industry is entirely dominated by the accessibility to raw materials. For the manufacture of sugar direct from cane it is essential that there should be not merely a sufficient quantity of sugar-cane in existence but that the cane should be fresh as it arrives at the factory since the sugar content of cane deteriorates rapidly after the stalks have been cut. In Indian conditions, a radius of 16 miles from the factory is considered as constituting the limit within which cane supplies should be obtained. It follows therefore that for the successful working of a sugar factory supplies of cane should be concentrated in the vicinity of the factory. Such concentration of sugar-cane areas is to be found only in the United Provinces, Bihar and Orissa and in the Punjab but not in Bombay or Madras except in a few favoured localities. The importance of the raw material will be evident from the fact that in the cost of producing white sugar, the price of sugar cane represents two-thirds and all other charges come to only one-third. Of the 29 white sugar factories 13 are in the United Provinces, and 11 in Bihar and Orissa; these two account for over 80% of the total. There are three factories in Madras and two in Bombay. If we consider refineries we find that United Provinces accounts for 7 out of 14 refineries, Madras has 3, Bihar and Orissa 2 and Punjab 2. The correlation between the area of sugar-cane and the place of manufacture is very intimate and there is perhaps no other industry which is so much dominated by the deciding force of its chief raw material, no, not even the iron and steel industry, where the iron ore costs less than a tenth of the value of the finished product. The question of cheap power is not material in the location of the sugar industry, practically the whole of the fuel required for generating power is provided by the bagasse. It does not appear that the future distribution of the industry will be very different from what it is now. Although the Madras Presidency is climatically one of the most favourable parts of India for cane cultivation, there is little hope of its becoming a great sugar producing centre. Similar considerations apply to Bombay and to Bengal. In the Punjab, the working season is limited owing to the setting in of frost in winter and so factories can be established only in South Punjab. Thus the United Provinces, Bihar and South Punjab

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which together are responsible for 80 per cent of the total area in India under sugar-cane, will continue to be the principal sugar-manufacturing areas of India.

THE IRON AND STEEL INDUSTRY.

The Indian Iron Works at Asansol, Bengal Iron works at Kulti and the Mysore Iron Works at Badravati are producers of pig iron; but pig and steel are both produced only at Tatanagar. The iron industry is entirely dominated by the locating force of raw materials, iron ore, coal and limestone. To make a ton of pig iron 2½ tons of coal and two tons of ore are required and it is therefore necessary to avoid this heavy transport and some freight. As between iron ore and coal the ore goes to the fuel because it is easier to handle the ore without much waste. In recent years however, partly owing to the economies in the consumption of coal which have lowered the importance of near access to coal mines relatively to that of iron ore and partly owing to a desire to take advantage of the market, the tendency has been for the fuel to go to the ore. This is seen both in the U. S. A. in the regions of Lake Superior, and in England where the British steel industries are moving to the sea coast or to the lower reaches of deep rivers.

In India the most important iron ores lie in the so-called iron belt extending over the district of Singbhum and the adjoining feudatory states of Orissa. These ores are very rich, the proportion of metallic iron frequently rising to over 60 per cent. Besides being cheap they lie close to the coal fields, the distance separating them being less than 200 miles. This is a very important consideration as the freight on raw materials is a very heavy item in the cost of manufacture. India occupies then a unique position in regard to the iron industry. The Tata Iron and Steel Co.,. Ltd., is able to bring its iron ore from a distance of 50 miles and its coal from about 100 miles. Compare this with Europe or America, where you find that coal or iron ore has got to come from a distance of over 200 to 300 miles and often from longer distance and you will realise its unrivalled position. India therefore is able to produce pig iron at less than half the cost in America, England and Wales and can export at half the British price from Calcutta.

But the economics of the steel industry are somewhat different. Sheffield is the centre of an immense steel industry but not of the iron trade. Trades requiring minute delicacy of handling and trades requiring the production of huge weights of metal both flourish in Sheffield which is an inland town dependent on costly

railway carriage for the transport of its wares in the production of which most of the material is brought from the coast. Swedish iron is got down for cutlery. Iron from Spain is used for the heavy finished products which are sent forward to the coast in turn. All this is due to the extraordinary skill of the worker which has descended through generations of handicraftsmen and to the best kind of technical training. Again the greatest steel manufacture of the world is in the western district of Pennsylvania which brings its ores from Lake Superior more than 1000 miles distant, the journey involving a double transference from rail to water carriage and vice versa and its coal by rail from 60 miles. It is thus clear that while the iron industry is almost entirely dependent upon raw material, the steel industry depends upon a highly proficient and technically efficient class of labour and upon organisation. Incidentally it may be stated that the reason for granting protection to the steel industry in India is to give time to enable the industry to train a body of skilled workers. Although it may be stated with confidence that this great iron belt will continue to be the region of India's iron and steel industry it is doubtful in view of the very large amount of capital required whether more works will be estalished at all.

IV

NEWER INDUSTRIES.

We shall now proceed to examine the location of some of the newer industries of India, which is complicated by the fact that in contrast to the iron and steel industry which finds both the ores and coal in close proximity to each other, these find that their raw materials are in one centre and their coal in another. Whether we consider the case of the paper industry, or the cement industry or the chemical industry, the distance that separates the principal raw material from coal has been a serious obstacle that retards industrial development. The best coal deposits and the great bulk of the collieries of India are concentrated in a comparatively small area, the outlying fields being of much less importance. The Raniganj, Jharia and Bokaro fields which together produce 90 per cent of the total coal output of India lie in a narrow strip running roughly from Raniganj, in Bengal (about 160 miles northwest of Calcutta) westwards for about a 100 miles. The greater part of the Raniganj coal field lies in Bengal; the remainder of it and all other fields are in the Chotanagpur divison of Bihar and Orissa. Hence any industry that has its raw material (other than the coal) in places far from this region will have to make a difficult choice.

An industry which is able to secure its coal cheap finds its other materials dear and vice versa. The only methods by which this obstacle may be removed are by securing a considerable reduction in the freights on coal by economising in coal consumption and by developing hydro-electric power. These points can be elucidated by studying the localisation of the paper industry in India.

PAPER.

The principal seat of the paper industry lies in Bengal and in the neighbourhood of the Hoogly in Raniganj. The Titaghpur Paper Mills at Titaghpur and Kankinara and the Bengal Paper Mill at Raniganj together produce more than three-fourths of the total output of paper in India. The factors that have dominated their location are proximity to coal and to the big Calcutta market; but these depend upon sabai grass for the material which comes from a distance of nearly 900 miles. The Upper Indian Paper Mill at Lucknow has a maximum capacity of about 3,700 tons of paper a year and uses sabai grass raw material. On the other hand, in the case of the remaining two paper mills, Indian Paper Pulp Company at Naihati, and the Deccan Paper Mills at Poona, the raw material that is used is bamboo in the first and imported wood-pulp in the other.

In examining the factors that influence the location of the paper industry in India we come across the changing economic import of physical conditions, a phenomenon to which attention was drawn in the earlier part of this paper. As long as sabai grass was considered to be the most important raw material for paper, the paper factory was partly influenced in its choice of a site by the accessibility of sabai grass, partly but not mainly or predominently. Unless as in the new Punjab Paper Mills (at Saharanpur) both the grass and hydro-electric power were found in one and the same place, the grass using paper mills had to be located near coal because no economy would result if freight on about 2½ tons of grass for about 900 miles is sent at the cost of paying freight on 5 tons of coal for nearly the same distance. But the future of the Indian paper industry is linked closely with the use of bamboo pulp owing to the excessive cost of the sabai grass and partly owing to the limited extent of market for the paper for which sabai grass is particularly suited. Thus the choice of a site for a paper mill in the future will be governed by proximity to the bamboo growing tracts, to cheap power and to markets. The Naihati mill is making paper entirely out of bamboo pulp and gets its raw material from

the Chittagong hill tracts and rails it to Naihati. If the mill had tried to save freight on this raw material and established itself at Chittagong, it would have lost the advantage of cheap coal and incurred the disadvantage of remoteness from the principal markets. Nor does it seem possible in India to establish a bamboo pulp industry separately from a paper industry. It is well-known that when wood pulp came to be used as the principal raw material for paper, thus displacing grass and rags, it became economical to divide the processes into two stages; a large number of mills devoted themselves solely to producing wood pulp and the pulp was made into paper in other mills situated often in a different country. The English paper industry depends for its supply on Scandinavian and the Baltic countries. The U. S. A. imports pulp from Canada and Sweden and Norway. If in same manner bamboo pulp could be manufactured in India near the place of the material, and paper made near the markets it will be a very real gain to the industry as a whole. But this implies two conditions neither of which seems to be present in India. There should be a large demand for pulp enabling mass production to be carried on and secondly there should be available cheap sources of power. Both conditions are satisfied in Scandinavia, while neither is satisfied in India. Most pulp factories will have to depend on coal bought from long distance. The only exception is Cuttack in Orissa where both bamboo and coal are in fairly close proximity. For the rest it seems clear that the future of the Indian paper industry depends upon the discovery and utilisation of local sources of hydro-electric power in close proximity to the bamboo growing tract, upon the reduction in coal consumption by using wood fuel and by securing the highest steam efficiency and upon a great reduction in transport rates for coal. Cheap power is the most important factor that determines the location of the paper industry while nearness to markets is nearly as important a consideration. While the Bengal paper mills have the advantage of cheap coal, they are unable to command the markets in all parts of India owing to the heavy railway freight on paper. It must also be pointed out that the development of the chemical industry is very essential for the prosperity of the paper mills as a large quantity of chemicals has to be used in the process of paper manufacture, Bleaching powder, caustic soda, rosin, china clay must all be available at cheap costs.

Five sites are considered to be most suitable for the exploitation of bamboo; Chittagong, Cuttack and the rest are in Burma. The Carnatic Paper Mill established with a view to supplying pulp to the existing paper mills in Bengal is singularly ill-

chosen and has little chance of success. While most of the mills have the advantage of either the raw material or coal, this mill finds both very expensive. Its bamboo having alternative value can be had only at high cost. Situated as it is, 627 miles off Calcutta it gets its coal very dear and has no conceivable advantage of location. Its only hope must rest in the manufacture of paper for use in the Madras market.

CEMENT.

The cement industry in India has grown enormously in recent years. It possesses great natural advantages. Limestone of excellent quality exists abundantly in many parts of the country and close to the railway lines. It has been found possible therefore to establish factories in the immediate vicinity of the quarries. The longest distance between the quarry and the factory is nowhere more than 20 to 30 miles. Suitable clay is invariably to be found near the works and there are ample supplies of it. But as in other industries it is the freight on coal that forms a serious item of cost and in this the cement industry has no advantage. The cost of power and coal is at least 40 per cent of the total works cost and often a great deal more. Theoretically half a ton of coal is required for one ton of cement; but Indian firms use more partly due to a lower output but mainly owing to the higher percentage of ash in the Indian coal. Thus in this industry too the concentration of coal within a limited area imposes a serious handicap. Existing cement factories are also badly located from the point of view of markets. There is no cement work anywhere within 300 miles of Bombay or Calcutta which are the principal markets for cement. Although therefore the industry has a protected internal market, it is unable to compete successfully in the chief Presidency towns. Katni and Jubbulpore in Central Provinces are the chief cement producing centres; Kaithamen in Rajputana and Gwalior are the other main centres. There is one cement company in Washermanpet (Madras) whose maximum capacity is 10,000 tons per annum. The cement industry is able to satisfy nearly all the requirements of India.

TANNING AND LEATHER INDUSTRY.

The tanning industry is so much dependent for its success on cheap supplies of tanning material that it has been changing its location as the supplies of tan bark get exhausted. Madras is the biggest centre in India for the tanning of hides and skins because the *avaram* bark is available cheaply and in plenty. Elsewhere the

cost of railway freights makes tanning with the bark commercially unprofitable. The establishment of the tanning industry in Northern and Central India is essentially a problem of finding cheap substitutes for *avaram* bark. At present the North Indian hides and skins are sent to Madras where they are tanned, and partly exported out of the country as leather and returned in part in the tanned state to Agra and Cawnpore and this has been possible because of the freight policy of railways. A subsidiary factor in the location of the tanning industry is the supply of local labour in Madras where large communities belonging to certain castes are pursuing this trade.

On the other hand, the development of leather manufacture in contradistinction to the light tannage of Madras and Bombay is almost entirely the outcome of military efforts to obtain supplies for boots and accoutrements. Where arsenals were established, there came into existence both a demand for boots and leather goods and a supply of hides and skins. Cawnpore's reputation as a big leather manufacturing centre was orginally built upon the Government Harness and Saddlery factory which became a great success. The market which the army provided was an important factor in the localisation of this industry. Moreover, Cawnpore possessed certain additional advantages; it is a convenient centre for the collection of hides from North India and for distributing goods to other places and at the outset there was available cheap babul bark, an excellent tanning material. Although Madras is not unsuited for leather manufacture and for the making of boots and shoes, the market is very much narrow in the south than in the north, and market is a major factor in the successful development of this industry.

THE MATCH INDUSTRY

The match industry is on the whole rather widely scattered in India. Apart from the smaller factories which are scattered nearly all over the country, there were in 1926-27, 27 concerns producing about 10½ million gross boxes as against a total consumption of 17 million gross boxes, in that year. India has a producing capacity of 18 million gross boxes, more than what she actually needs. It is an interesting question whether the demand for matches in India will go down or increase in the future; for as against the introduction of electric light limiting its use, there is the normal rate of growth in demand for domestic use and the increasing demand of the tobacco smokers. The industry has grown to its present dimension since 1922 behind the high tariff

duties. There were 11 factories in Bombay producing nearly 50 per cent of the total, 10 in Bengal contributing about 25 per cent, 5 in Burma turning out about 15 per cent and thus these provinces together had a capacity of over 90 per cent of the total output. India uses different classes of wood; some factories use aspen splints and aspen boxes; others Indian wood, both for splints and boxes; while some others use aspen splints and Indian wood boxes. India is not unfavourably located in regard to the chief raw material, and fuel is not a relevant factor in the choice of a match factory as the waste wood from the various processes of manufacture provides nearly all the fuel that is required. One of the biggest match factories in India is that established by the Swadeshi Match Trust at Ambernath (near Bombay), but it has been badly chosen owing to the climatic conditions of the place, which quickly dry up the wood. The dominant factors of location in the match industry are cheap labour, as wages cost is a major item in the total cost of production and an extensive market. Both conditions are satisfied in India in several places and indeed at present India enjoys the advantage of a low labour cost.

THE HEAVY CHEMICAL INDUSTRY

And now finally a word about the chemical industry the location of which raises some complicated and opposing considerations and throws light on the general problems with which we are concerned. It also illustrates how much an industry which may possess many natural advantages may be held up in its development by reason of one weak link and how national and economic policy can affect industrial development nearly as much as purely geographical factors. The heavy chemical industry comprises a large group of chemical products of which sulphuric acid, hydro-chloric acid, nitric acid, magnesium sulphate, potash, alum, aluminium sulphate, zinc chloride, are the most important. These chemical products are used in almost every important industry, in the textile, leather, paper, glass, porcelain, rubber, artificial silk and other industries and in the making of paint, varnish, etc. They are also used in the manufacture of ammunition. Thus the industry is a key industry in every sense of the term. The most important factors affecting its location are first cheap coal and power; second raw materials and third market. So far the industries are situated at Calcutta and Bombay owing to the natural protection they enjoy from foreign competition on account of high freight charges. But they are unable to work economi-

cally as their output has to be limited to the narrow market within their own respective areas. If the industry is to establish itself firmly and face foreign competition, it must be established on a fairly large scale and be able to sell not merely in its geographical market but at other parts as well. In choosing a site for the industry one has got to take note of the following factors. The chemical industry requires a greater variety of raw materials than any other industry. The majority of these raw materials are available in India. But it is difficult if not impossible to find a site which is in close proximity to all the raw materials as well as the bulk of the market. Coal is an essential raw material of all industries. For power purposes hydro-electricity where it is cheap can be an economic substitute for coal. But where large quantities of steam and heating are required as is the case with many of the chemicals considerable quantities of coal would still be required. The largest and best supplies of coal are found in one part of India, Bihar and Bengal. From the point of view of cheap coal the best situation for a factory would be in this part of India. Unfortunately, however, the majority of the other essential raw materials are not found in or near the coal fields. Magnesite which with sulphuric acid is the principal raw material for the manufacture of epsom salts has to be got down from Salem, a distance of 1,200 miles. Bauxite, the principal raw material for alum and aluminium sulphate, must be carried for about 500 to 600 miles from the Central Provinces. The principal raw materials for the manufacture of soda and soda compounds are coal, limestone, salt, water, ammonia liquor from coke ovens. All these are available in or near the coal fields but salt is not available and has to be transported. Thus the whole question turns on the freights charged by railways who have it in their power to develop or check the growth of an industry by manipulation of freight rates. Railways can if they desire give protection to industries by quoting special rates or deprive them of protection by quoting higher rates although these may be within the prescribed limits. Thus the possession of natural advantages by an industry is not in itself a guarantee of success; a single weak element might throttle its growth.

Bengal is on the whole a very promising centre for the chemical industry but except as regards fuel Bombay has a decided advantage over Bengal. The market for chemicals is greater in Bombay while sulphuric acid requires little or no fuel and to the extent to which that acid enters the manufacture of other chemicals, Bombay is at no disadvantage.

V

CONCLUSION

I must now bring this study to a close. It has not been possible within the limits of a paper of this kind to make an exhaustive study of several other industries of great interest. There is for example the case of the oil milling industry. Madras is so rich in its oil seeds that one might have expected the establishment of a big oil mill industry in the Presidency. But owing partly to lack of coal but more especially owing to the inertia and lack of organising ability on the one hand and to the difficulties of transport of oil and oil products on the other, we have not made much headway. Here again, the question of the relative freight rates on the raw material and on the finished product, assumes considerable importance. There is also the fact that foreign countries prefer to import the raw matrial rather than the finished product. At present Bengal has a very large number of small oil mills but it is in Southern India that the biggest oil mill is to be found, the one established by Tatas in the West Coast. The rice mills are another group of industry which has established itself chiefly in the rice growing areas. Burma, Madras and Bengal are the chief centres of this industry. Again, in a country like ours there can be no question but that a study of the localisation of cottage industries in some of the urban areas will be of profound interest to students of geography and of economics. Considerations of time and space and a sense of inadequate equipment for that task have precluded me from entering into that vast uncultivated field of enquiry so promising in its harvest.

I hope, however, I have said enough to convince you that in the localisation of industry in a country the geographical and economic factors act and react on one another. Accessibility to raw material in itself has no meaning without relation to the cost of transport and it is open to a country to determine what its transport rates for fundamental materials like coal shall be. While the production of raw material is governed more by geographical factors, the manufacturing processes are a complex form of activity depending for their success upon personal as well as physical factors. The history of the growth of modern industry affords striking testimony to the fact that it is not necessarily the nation that possesses rich raw material that will attain a high level of prosperity. It is true that man's labour is more productive in proportion not as he combats but as he utilises nature's

forces and thus no one can deny that physical conditions have a great bearing on the localisation of industries. But equally important is another raw material for successful production and that is the possession of certain inherited and acquired qualities by the people which would enable them to adapt themselves to changing conditions of economic life. But these qualities in turn have themselves been affected by physical factors like climatic conditions. The prosperity of the people of the temperate regions cannot altogether be explained without reference to the effects of climate upon their general efficiency. A nation that is richly endowed with the qualities necessary for organisation and leadership has a better chance in this world than another that may have rich natural products but is poorly endowed with these mental abilities.

But the possession of either the physical products or of mental qualities can never long remain with any nation without being questioned at every turn. For science is fast changing the relative importance of the different kinds of raw material as sources of manufacture and soon the long-prized possession of some material object is found to be nearly valueless. On the other hand, each nation is seeking to improve itself in various ways and the initial handicap due to want of skill is removed by a carefully planned system of general and technical education. In this way, physical and personal factors play upon one another and give to a study of the factors that determine the relative prosperity of different nations an interest that is unique and unrivalled.

In recent times of all the factors that go to the determination of a site for an industry the influence of market has been gaining ground. The advantages to be derived from personal contact between consumer and trader and producer have caused capital cities in each country to become the homes of miscellaneous industries of all grades and especially of high grades. Further, new industries like the luxury trades and food industries which have grown enormously in recent years in most countries have favoured the capital cities where large numbers of people live. In so far as market forms a dominating factor of industrial location, India is favourably placed. It was under the influence of this factor that during the last decade industries like matches, cements, paper and so on have been able to establish themselves firmly despite certain severe handicaps.

A country like India struggling to become an advanced industrial country cannot afford to take the risks arising from bad and ill-chosen location of her industries. Although mistakes have occurred here and there, they are relatively unimportant. We have the advantage, not possessed by old industrialised countries where the choice of localities has been already fixed for them, of being enabled to plan anew, to make a scientific survey and to choose localities after a careful consideration of the many opposing considerations that enter into it. Upon a wise choice of location of our industries lies to a large extent the economic prosperity of India.

Distribution of Population*

BY

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The subject of "Distribution of Population" can be studied from many standpoints as for instance (1) Distribution on the regional or the purely geographical basis, (2) on the political basis as between various States, (3) as between the rural and urban areas, (4) on the basis of sex and age and (5) on that of occupations. The subject is of interest not only to the geographer but also to economists and students of political science.

Although when the world as a whole is taken the population per square mile is so low as 33, there are certain regions of the earth—Belgium, England, portions of India etc.,—where the density is as high as 650. Population has a tendency to concentrate itself in certain regions of the earth. Until changes were brought about by the Industrial Revolution of the 18th century it was those regions that had natural facilities for agriculture, facilities in the shape of fertile soil, rivers and other sources of water, that came under this category. The Nile Valley, the Valley of the Euphrates and the Tigris, the Indo-Gangetic basin, and the region of Hoangho and Yangtse-kiang illustrate this feature. But the changes introduced by the mechanical inventions of recent times brought about the congregation of people in manufacturing and mining areas. Machinery implies the organisation of industry on a factory basis and the coming together of large numbers of people into a small area. Here again nature has played its own part. For, although manufactures can be carried on in any part of the world provided that there are good means of transport, still those parts of the world which contain good supplies of coal and iron and which have a temperate climate enabling people to work hard and steadily for long hours and put forth a sustained effort have advantages as manufacturing centres over those regions situated in the hotter zones and not having supplies of iron and coal or other kinds of fuel. From all this one may conclude that it is the geographical causes that determine the distribution of population.

But human action and influences are in this as in other fields in a position to modify the force of physical environment, and

**Inaugural Address delivered to the Vizagapatam Branch of the Madras Geographical Association.*

this in a variety of ways. (1) There is the force of political action regulating the even flow of migration from the less favourable to the more favourable parts of the world. Though by nature there is room for a denser population in United States, Canada, Australia, New Zealand, etc., the laws made by the governments of these States have prevented immigration into them. (2) There is also the force of sentiment. Attachment to one's own country is generally strong among the large majority of people and very few care to leave their original homes and migrate to distant parts of the world even though the latter have many geographical facilties attractive to intending settlers. Love of adventure, preparedness to overcome the initial difficulties involved in settling in a new country are required before migration can flow freely on the basis of physical factors. (3) Growth of science and knowledge is another modifying influence. An area having rich agricultural resources or natural facilities for industry may remain undeveloped and therefore have a thin population if access to those regions is difficult or if it has any drawbacks like malaria, etc. The thinness of population in the Agency tracts of the Circars is the result of these influences. It is only when we are able to combat the diseases peculiar to them, when knowledge of medicine advances and when better methods of road-construction are devised that such tracts can be opened up and distribution of population become more even as between the plains and the agency. If during the 19th and the 20th centuries many parts of Africa have become more thickly inhabited it is due to the increase of scientific knowledge. (4) Even where geographical conditions are unfavourable people may be tempted to settle in such areas for the sake of escaping from political oppression, religious persecution, etc. (5) Changes in habits relating to marriage and in ideas regarding the size of the family, etc., are also instrumental in preventing a population from growing in accordance with purely geographical influences. These habits vary from country to country, and the density of population in different countries tends to vary because of variations in these habits and in the standards of life.

Within the same country people tend to distribute themselselves between the rural portions and urban areas. The proportion between the rural and urban population is varying from country to country. In Australia only 30% lives in rural tracts and 70% in urban areas; in India 70% live in villages and 30% in towns. The primary characteristics of a town is the concentration of a large population over a small area, and the relative density of the rural and urban population depends therefore on

all those factors that bring about the growth of towns in general. Here again the importance of these factors has not been the same throughout history. In early days it is round fortresses from which the neighbouring country could be defended that people gathered in large numbers. With the growth of specialisation in industry and craftsmanship a place to which finished products could be brought for sale became necessary and therefore those places which had facilities as market centres became towns. Thus places on the banks of rivers, or those situated at the junction of several roads attracted purchasers and sellers and in course of time became thickly inhabited towns. In more recent times it is places where manufacturing industries could be easily carried on that towns arose. Finally with the growth of international trade and territorial division of labour places on the coast having harbour facilities and places in the interior in which huge quantities of goods can be easily assembled have grown into towns.

Apart from causes that contribute in general to the growth of town life two other problems require study. One is 'what determines the distribution of population between towns and villages in any particular country' and the other is "why is it that the general tendency is towards a higher proportion of population living in towns". The first depends on the relative preponderance of agriculture and manufactures in a country and the degree of agricultural improvement. Preponderantly agricultural countries like India should necessarily have a higher proportion of rural population. But if the degree of agricultural improvement and efficiency is of a high order there will be a larger per capita output and with a smaller agricultural population the country's needs may be satisfied and this will lead to a larger drift towards towns. This explains to some extent the situation in Australia.
The general drift towards urban life is attributable to a greater proportionate demand for luxuries, comforts and necessaries of life which are of a non-agricultural character with advance in civilisation. The need for mere food is becoming less; and the demand for fineries is increasing and these can only be produced by highly trained craftsmen and skilled labourers using machinery and working in factories. The tendency therefore of civilisation is to make town life more important and more attractive.

The distribution of population according to age depends on birth-rate and death-rate. It is not so much the absolute death-rate that has to be taken into consideration but the relative death-

rate at different age-periods. In advanced countries the tendency is for birth-rate and death-rate to become lower—the former due to a rise in the standard of comfort, the growing importance of woman in society and the general adoption of methods of birth-cotnrol. The latter is due to greater commands over the necessaries of healthy life and the general growth not only in the knowledge of preventive medicine but also in practical measures adopted in accordance with this knowledge. The net result of these forces is to increase relatively the proportion of people of old age—those beyond 65. This taken along with the other tendency to keep boys and girls for a longer period in schools reduces the proportion of people contributing to the production of wealth. Generally those between 15 and 5 may be regarded as the class of persons coming under this head; and it is on their efficiency that the comfortable life not only of themselves but also of those below 15 and above 65 depends.

Distribution of population on the basis of sex is also of much importance. Here again it is not only the absolute proportion of women to men but also the proportion at different age-periods that has to be considered. A high death-rate among middle-aged men or women affects prosperity much more than a corresponding death-rate among people beyond 60 or 65. The fact that women are taking to gainful occupations in increasing numbers is also a point of considerable importance. They are becoming productive factors and have ceased to be mere consumers of wealth. But this is counterbalanced by the disadvantages it creates in the matter of managing the household and looking after children and bringing them up properly.

These and other questions relating to the 'Distribution of Population' have to be investigated on scientific lines with special reference to local conditions and it is hoped that the Local Branch of the Madras Geographical Association will turn its attention to its study.

Survey and its Usefulness to Geography

BY

K. N. Narasimhachari,

Assistant Director of Survey.

Any amount of detailed description of a country without a map to illustrate it would be something like groping in the dark and would be no better than a mere traveller's tale. A map is, therefore, a necessary adjunct for a true study of geography; there can be no map without a survey. This very well establishes the relation between Geography and Survey.

It would be of great academical interest to know when Survey was first started in India and what led to it.

When the British people first came to India to push on their commerce early in the 17th century, they felt the necessity for a map of the Indian coast and of the seas adjoining it, to indicate therein the position of the important ports and the sea routes to reach India. Thus began the Survey of the seas and the coast. During this survey some observations for Latitude and Longitude were taken evidently to fix the position of Indian coasts with reference to other countries.

The idea of land surveys did not enter the minds of these commercial people until they acquired territories in India and thus possessed an interest which happened only in the latter part of the 18th century. The land survey and mapping of India advanced with the acquisition of territory. About the middle of the 18th century, D'Anville, the great French Geographer prepared a map for India from the knowledge of India "derived from routes of solitary travellers and rough charts of the coasts" and his map appeared 5 years before the battle of Plassey. Eight years later, Major Rennell, the father of Indian Geography who served under Lord Clive was at work in the newly acquired territory of Bengal and Behar laying foundation for the construction of a map. He prepared maps of the rivers of Ganges and Brahmaputra. These maps are even now useful in the study of the causes which operate to effect the changes which have since taken place in these rivers especially in the deltas.

About 1780 the survey was extended to Madras along the East Coast. The Carnatic War also hastened the survey and the compilation of maps for the Carnatic as an indispensable need for the war. Thus in less than a decade a small scale map for the whole of India was compiled from the materials collected during the different periods. Of course, the compilation presented lot of difficulties as the surveys were not conducted on a scientific basis. These maps were very inaccurate and were only of service during war while India was an unknown region and ceased to be of any value when the vast country came to be administered by the British.

It was not until the end of the 18th century that a trigonometrical survey was accepted as the only survey affording accurate basis for the mapping of a large area of a country. The commencement of this work in India was only a few years behind that in France and England. The author of this survey was Mr. Lambton afterwards Colonel. This trigonometrical survey consists of dividing a country into a net-work of major and minor triangles to provide fixed points from which the important topographical details such as hills, rivers, roads, railways, etc., are inserted, the accuracy of the triangulation being checked by means of Stellar observations for Latitude and Longitude which are of considerable imporatnce to Geography also.

It will be interesting to know that the Madras Obsevatory is of very great importance as being the 1st observatory where observations were taken for Longitude since 1787 though the building was erected only in 1792 and with reference to the Latitude and Longitude of this observatory, those of the other places were computed and the geographical position of India on the globe depends on the accuracy with which the position of Madras Observatory has been determined.

So much for the construction of maps for large areas. But when we come to small areas such as villages and towns, the above survey is of no use as the maps of small areas should be on much larger scale and be of sufficient accuracy and show greater details. For example, unless a village map shows the fields owned by the villagers, the source and system of irrigation, etc., it is of no interest at all. For such a purpose, survey of the fields, which is called Cadastral or Revenue Survey, is done. The object of this survey is to define the limits of each holding in a village, measure and prepare a record of measurement for each field and furnish its area and that of the whole village.

It is certainly absurd to study about other villages, taluks, districts or countries, without knowing anything about one's own. It is in the village schools that a proper foundation for study of Geography, nay for other sciences as well, should be laid. Such a study without a proper map is something like the blind leading the blind, and this important need of the public is served by the *Revenue Survey Department.*

From these village maps, taluk and district maps are also compiled and an atlas of the Presidency as well, so that the Revenue Survey is not only useful for preparing large scale maps of small areas but also for the compilation of small scale maps of large areas such as taluks, districts and presidency with greater accuracy than those compiled under the system of topographical surveys. Thus a study of geography commencing from the village upwards is very much facilitated and made more impressive by reference to the various maps.

I shall close this article by quoting the words of Mr. Clements R. Markham, C.B., F.R.S., in his Memoir on Indian Surveys.

"The Revenue Surveys of India are one of the basis on which the whole fiscal administration of the country rests. By their means, the wealth of the various provinces is ascertained, as well as their food-producing capabilities and their power to bear taxation. The surveys furnish the information comprised in agricultural statistics, without which the statesman is deprived of the knowledge enabling him to improve the condition of the people, to increase their means of subsistence, to avert famines, to add to the wealth of the country, and to adjust taxation."

"The ideal survey, while furnishing complete information for settlement purposes, should be executed throughout on accurate principles, and supply materials for compiling maps for general use. In the Madras Presidency alone has any approach to a compliance with all the demands been effected. The Madras Revenue Survey must, therefore, be considered as, on the whole, the best in India."

Modern Ideas on the Formation of Rainfall

BY

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Rainfall is a natural phenomenon with which every one is familiar. Its importance for human welfare is so well-known that from the dawn of mankind people have been propitiating the Gods to get rains at the proper time. While its beneficent moods are so ardently desired, its violent manifestations in torrents which result in deluges, are equally dreaded. Our knowledge of the processes involved in this phenomenon is by no means adequate to its importance. The very familiarity has perhaps blunted the keenness of the natural spirit of inquiry. Facile and simple accounts of complicated natural phenomena which are to some extent unavoidable in early schooling might have also contributed to retard investigations by the false sense of satisfactory understanding which such explanations induce. It is proposed therefore in what follows to give an account of our present knowledge of the formation of rainfall and incidentally also bring out one of the outstanding advances of modern meteorology.

We all know the explanation of rainfall which was taught in elementary classes and the experiment with a retort and spirit lamp. Rain is due to evaporation and condensation. Solar heat is the evaporating agent which transforms water from rivers, lakes and the oceans, and moisture from vegetation and wet ground into aqueous vapour. This vapour finds its way into the atmosphere and on cooling it is condensed into water which falls as rain. The question that now arises is this: How is the cooling of the atmosphere brought about? A consideration of this question will show that evaporation and condensation is only the beginning and not the end of the story of rainfall, unlike what many who have not thought of the subject after the retort experiment may imagine.

Cooling of the atmosphere can be caused by three processes; radiation, mixing, and upward movement known as vertical convection. A radiating body loses heat and therefore cools. All that radiation cooling could do directly is to cause the deposition of dew. When two currents of different physical properties mix

together, the mixed sample is cooler than the hotter of the constituents. This process often gives rise to fogs, mists, etc. If a mass of air ascends up, it will go on decreasing in temperature as it proceeds higher and higher. It is worth while to show how this happens. Pressure decreases in the atmosphere as one goes higher, for pressure is nothing but the weight of the superincumbent column of air and this column diminishes as one proceeds up. Now, when a mass of air rises it comes into a region of lower pressure than where it started from. It therefore expands and it is well-known that gases while expanding without exchange of heat cool down rapidly. It may be assumed that the loss of heat energy due to expansion is not compensated to any extent by a gain of heat from the surrounding atmosphere through which the mass of air is rising. Thus cooling results from upward vertical movement and this is known as "Dynamic cooling."

In order that cooling may produce condensation, it is obvious that the process should proceed to such an extent as to saturate the air with the vapour it contains. It is however, perhaps not so well-known that the presence of 'nuclei' is also necessary to start condensation even in a saturated mass. The 'nuclei' are the particles on which condensation of moisture takes place. It can be shown that condensation does not start in dust-free air even though saturated, but that the moment some smoke is admitted a cloud appears. Dr. Aitken (1880) thought that dust particles acted as 'nuclei'. This view is however now doubted and importance is attached to the hygroscopic (i.e., possessing an affinity for water) property of particles in deciding whether they are 'nuclei' or not. Some examples of hygroscopic 'nuclei' present in the atmosphere are salt and sulphuric acid.

The minute particles of water thus formed by condensation round a nucleus are held in suspension in the air by the vertical currents which, as shown below, are invariably present when condensation on any large scale takes place. A very large number of these particles coalesce together and appear as a cloud. When the particles increase in size by coalescing and further condensation, they can overcome the resistance of the air currents and fall as rain.

Although mixing, radiation, and convection can each act to cool the atmosphere, yet it is now established since the time of the German Meteorologist Von Bezold that the first two processes cannot account for the extent of cooling involved in any continuous rainfall of moderate duration such as very often occurs.

Vertical convection is therefore the only effective rain-producing process in Nature. The question therefore arises: In what ways are upward movements of the atmosphere brought about? Strong local (not widespread) heating of the earth's surface by the sun is a powerful cause of vigorous convection. The afternoon thundershowers that burst over many places in summer are good instances of rain which originated in convection set up by intense solar heating. Secondly, permanent physical barriers, such as mountains lying across the path of the prevailing wind, induce forced ascent of the air blowing against them. The heavy rain that the west coast of the Peninsula gets is a very well-known and obvious example of orographic influence on vertical convection and rainfall. A third and very important form of convection is that which arises out of purely meteorological causes. This point needs further explanation. A cold mass of air can induce convection in a lighter warm mass by under-cutting the latter and thereby lifting it up, or by acting as a barrier and making the warm air ascend up its gradient as over a hill. The surface separating two air masses of different properties has been appropriately called a 'front' i.e., the arena which demarcates two bodies (in this case air masses) which are in conflict against each other and produce weather. These ideas on the mechanism of the meteorological conditions favourable for rainfall form the most notable contribution of the present school of Norwegian meteorologists to modern weather science. To them also we owe the terminology of 'fronts' and the discovery that there are such non-permanent and invisible partitions in Nature, whose identification marks a great advance in practical meteorology. Recent work in India has shown that it is possible to apply these ideas to the cyclones of the Indian seas and recognise the discontinuities, as these partitions are called. These studies have also indicated the important part that these discontinuities play in causing the very downpours which are associated with the cyclones. The heavy rains of December last when Negapatam got 14" in 24 hours is a recent instance of cyclonic rain which must be fresh in the minds of many in the Madras Presidency.

This brief resume will naturally raise the question as to how far all this new knowledge has led to practical results in forecasting rainfall. The answer is that while there has been a marked improvement in the accuracy of forecasts based on the new ideas, they have also raised problems which await solution and shown the difficulties in the way of getting an adequate account of all the factors involved. For instance, the extent of convection which

will take place in any given case is primarily determined by the vertical temperature structure of the environment through which an air mass has to ascend. Though instruments have been devised to ascertain this structure or lapse rate of temperature as it is called, their costliness and other considerations have hitherto stood in the way of their employment on a large scale for everyday work. Quantitative estimates, connecting the intensity of the phenomena with the contrast of properties of air masses from which they result, have yet to be brought into everyday use. The identification of the different air masses, a knowledge of their properties and extent in space and the accurate location of 'fronts' from day to day require an organisation which only a few countries possess at present. Looking at the achievements of the past and the impetus recently given to meteorological investigation by the needs of aviation, it may be hoped that the new problems will be solved in such a way as to lead to further progress in the methods of anticipation of Rainfall.

Extracts from Periodicals

GEOGRAPHY AND INTERNATIONALISM

BY

W. M. RYBURN, M.A.,

THE TEACHER'S OPPORTUNITY

As a general rule, living in a foreign country broadens one's outlook, and enables one to escape from the nationalistic shell. True, it sometimes simply hardens that shell, but generally speaking the person who has lived abroad does have glimmerings of that international sense, which is so desirable, and on which so much depends in these days of inter-dependence and inter-relation.

It is, or should be, the aim of all good teachers to cultivate an international outlook in their pupils. Obviously they cannot take them to live in foreign countries, cannot even take them for visits. Only the favoured few get chances to travel, and then usually not till their school days are over. But in the subject of Geography the teacher has a tool which may be used to enlarge the international understanding and increase the world-feeling of his pupils.

It is unnecessary in these days to enlarge on the necessity for the cultivation of such understanding and feeling. The Great War is still too recent, and in the international sphere crisis follows crisis too quickly for us to have much doubt about the grave necessity for teaching our pupils that their country is but part of a whole, and that the welfare of the part depends on the welfare of the whole. Usually however, it is thought that the instilling of an international outlook is the work of the history or the civics teacher. Much as can be done by the teachers of these two subjects, there is also a great deal which can be done by the Geography teacher.

There is sometimes a danger that the geography teacher has his own mental horizon and therefore the geographical horizon of his pupils, too filled with things and ideas, to the exclusion of people. There is a danger of forgetting that there is a side to geography, known as "human geography". And from the point of view of general culture and of real education it is people and

the effect on them of such things as geographical position, climate, trade, and so on that is important. We must, if the full educational and humanistic value is to be obtained from the subject give a prominent place to the human element, and to the effect of "things" on people.

For the international outlook, it is necessary in the first place that we understand the other peoples of the world. Understanding them does not simply mean knowing about them, their customs and their ways, important though this is. It means understanding why they are, what they are, and why they do certain things in certain ways. For instance, there is the effect of climate on the different peoples of the world. A study of climate can very materially help us to understand the characters, ways of life, and history of different peoples, and can help us to understand why they are different from ourselves. It can open up numberless roads for the inculcating of an interested and sympathetic understanding of those who live in other countries. Again, the study of the effect of geographical position on nations is very often the key to the understanding of their policies and actions. All the facts of Geography have their effect on the people concerned, and if a basis for an international outlook is to be successfully built up these effects should be carefully worked out and made clear. Here, of course correlation with history comes in and the two subjects should work hand in hand in developing in our pupils the right attitude to those in other lands.

THE HUMAN INTEREST

In every geographical fact there is a human element or a human connection. This is especially the case in the realm of economic geography. Learning that we get tea from Ceylon and wool from Australia is not enough if we are teaching with the international standpoint in view. The pupils should be shown by word and other pictures the human element, which is involved in the statement, "Ceylon produces tea" and "Australia produces wool." Thus, while, of course, things are not left out, persons are brought in, and given their due prominence. Pupils who are taught geography in this way will be in a far better position in later life to judge on the merits of free trade and tariffs, that thorny international question.

Not only is an understanding of the human element and connection involved in all geographical facts necessary, but, as far as possible there must be imparted an emotional content. It is not

enough to give facts, to appeal to the understanding. Those facts and that appeal should be given an emotional tone. Geography, if rightly taught can implant in pupils a friendly disposition for others. This disposition, of course, is founded on an understanding of the facts involved. But the facts and their human connections should be presented in such a way, and in such a context, that they are emotionally coloured. This is well-known in the teaching of history, and no subject is more potent, because of its emotional concomitants, for the development of a strong nationalistic feeling on the one hand, or of a strong international attitude on the other. Geography can be just as potent in the cause of internationalism if due attention is paid to the emotional concomitants of the facts presented.

We learn in geography what the sheep farmer in Australia, to take our former illustration again, does *for us* in order that we may have our wool. We also learn what our fellow countrymen do *for the Australian sheep farmer*, in order that he may have his billy of tea. He works *for us* and we work for him. There is a co-operation in the game of life. In this and in other ways especially on the economic side of geography, an emotional background may be given which will have a very great effect in producing in our pupils the international mind and disposition, the latter being very important.

EMPHASISE POINTS OF RESEMBLANCE.

In dealing with the human element in Geography the mistake is sometimes made of laying too much emphasis, or sole emphasis, on the differences between peoples and nations. It is also important to emphasize the likenesses. Differences certainly have to be pointed out, but sometimes the impression is left that other people are altogether different from ourselves, whereas they are more alike than they are different. Differences could be emphasized less, and likenesses given their due place. More emphasis on the likeness between the village community in India and that in Central Europe, and between industrial towns in India, Europe and America, to take two examples, would help immensely in inculcating the lesson that all men are kin.

Naturally the value of Geography in the development of the international mind, depends very largely on the teacher. It is to him that we must look for the emotional background that is so necessary. If the teacher has not an international outlook himself, it will not be possible for his pupils to cultivate it. The same is,

of course, true of history. It means that the teacher will have to approach his subject from a somewhat different angle than that of the usual text-book, and that of the usual examination. (Examination work need not, however, be sacrificed). It means that the teacher himself must understand those about whom he is going to teach. He must cultivate a sympathetic imagination. He will find that the imaginations of his charges will respond.

The importance of Geography from this international point of view cannot be over-emphasised. From our schools come the men and women who are to dictate the politics of the future. Geography should have an honourable place among those subjects which help the future rulers of the country to understand their fellow human beings with sympathy, and thus have a truer grasp of the essential factors in the world problems of their day and generation. Geography is a world subject, and thus, taught from the proper standpoint, can do much in preparing the child of to-day for the world citizenship which will be his to-morrow.—*The Hindu: Educational and Literary Supplement*—September 6, 1931.

GEOGRAPHY IN THE NEWS, OR THERE AND NOW

BY

E. J. G. Bradford,

The University, Sheffield.

It is a well-known psychological fact that both sentiments and habits die when the opportunities for their expression are restricted. It is equally true of calf-love and card tricks. Now geographical education aims ostensibly at the development of sentiments or sympathies and at habits or specific skills. In how many prefaces may we find a reference to the sympathetic understanding of the activities of human beings?

* *

How many grammar-school pupils, on reaching the age of 40, remember the form of the third declension given in their Latin book? How many one-time primary school pupils of the same age can work out problems in stocks and shares? Only in exceptional cases do the life-work and pastimes of ordinary people provide scope for the exercise of the specific habits or make demands on scraps of information acquired during their school education. . Cases of men and women turning to the Latin classics

because of an engrossing interest in them, or following the movement of the prices of stock on the market just because they are fascinated by tracing the effects of economic influences, are even more rare.

* *

The geography specialist, the classical master, and the primary school teacher hope—a pious hope, no doubt,—that the interest developed in school, and the specific habits perfected there will become more than beautiful angels in the educational heaven imagined by generations of educational theorists. He hopes that they will play a part in real life. Real life, especially for the child, is a day to day affair. Only with the growth of sympathies, prejudices, and knowledge are the fresh daily problems reacted to in relation to the events of yesterday or the more distant past. For the child, things are happening *here* and *now*. The aim of the geographer is to persuade his pupils that they are also happening *there* and *now*, and to exhibit the *here* and *now* in terms of the *there and now*.

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Newspaper reading is possibly the only post-school educational influence common to all. But newspapers differ greatly among themselves. Some aim at developing significance mainly through pictures, others primarily through striking headlines, others through smoothly polished paragraphs. Generally speaking, newspapers describe day to day events in pictures, paragraphs and statistics. Hence the advisability of bringing school work to bear on the newspaper. It is a practice that may do something to illuminate and correct the interpretations of this future medium of instruction. A more probable value arises from the correcting and illuminating influence which the newspaper may have on the school studies and text-books. The newspaper introduces just that element of reality that is born of day to day experience, the second-hand experience the *there* and *now*.

* *

The modern text-book introduces much that is of real human interest, but it unduly stresses generalisations. Thus there is much about the climate of foreign countries, but an astonishing poverty of detail about the actual day to day weather experienced. A description of the weather on a particular day is more real than a description of the average monthly or seasonal conditions. On such a topic the newspaper is invaluable.

The sunshine records at Margate, Buxton, or Morecambe can fill out the records made at a Hertfordshire school. Pictures of flooded meadows in the Trent valley, queues of people with jugs

and pails awaiting their turn at the water cart that supplies the deficiencies in a limestone district, have a reciprocal value for the pupils living in two such types of country. Pictures of harvesting in August and in October bring home to the pupils living in these localities the differences associated with latitude.

* *

The time of high water at Bristol, Liverpool, and Glasgow on the one hand, and of Southampton. Dover. and London on the other may lead to simple generalisations regarding movements of water from day to day. The mild thrill of waiting for the hour that has not yet been published has a touch of the "serial" atmosphere that is so attractive to the juvenile readers of weekly papers.

For at least eight months in the year the Sports page has potential scholastic value. The sorting out of the towns according to their country, irrespective of the Division in the Football League, emphasizes week by week the location of those towns and their position in regard to other towns. The average score of the teams in the country can be compared with the average obtained by teams in another country. Placing little flags on the towns that win or lose is a simpler operation. This does not sound a very intellectual exercise, but it does help to fix locations in the mind, and locations are the material of geographical argument. The very-much-overworked geographical regions are but collections of locations harbouring some common element of observation.

* *

The *there* and *now* outlook on the world is stimulated by the systematic or even random collection of cuttings from papers and periodicals. Three or four large sheets of brown paper folded in two and pierced by a piece of string at two points about halfway along the fold, will, if the string be knotted, hang from a nail on the classroom wall and serve quite effectively in the guise of a geographical scrap book. Cuttings can be pinned to these sheets. Of course, in time the cuttings get brown and illegible. This is a great advantage, for it necessitates that each generation of pupils shall make its own collection. Such a book loses half its value as an heirloom, it is no longer a day to day affair.

* *

With one good class atlas and gazetteer, sections of the class can be set to work up a weekly continental bulletin. Each group looks after a separate continent. The bulletin may record a heavy

wheat crop at Northam, W. A., gunmen at Raleigh, N. C. or a three-headed ostrich hatched at Queenstown, S. A. . . . . There and Now.—*Nelsoniana*

INDIAN CENSUS STATISTICS

Revised Figures

10.6 PER CENT INCREASE IN POPULATION

The total population of India is 352,986,876 of which 181,921,914 are males and 171,064,962 females.

There is an increase of 10.6 per cent of the population since 1921. The present total population of Hindus throughout India is 238,330,912. Muslims number 77,743,928, Sikhs: 4,366,442 and Christians 5,961,794.

BRITISH INDIA

The following are the figures in British India where the grand total is 271,273,107 of whom Hindus are 176,934,435, Muslims are 67,085,510, Sikhs are 3,192,169, Christians 3,531,703.

The following are details province by province in British India:

Ajmer-Merwara: The total population: 560,292, of which Hindus are 434,509, Sikhs 341, Jains 19,497, Muslims 97,133, Christians 6,947.

Assam: Total population 8,622,251 of which Hindus are 4,931,760, Sikhs 2,497, Jains 2,636, Buddhists 14,955, Muslims 2,755,914, Christians 202,586.

Baluchistan: Total population 463,508 of which Hindus are 91,432, Sikhs 8,368, Muslims 405,309, Christians 8,044.

Bengal: Total population 50,122,550 of which Hindus are 21,537,921, Buddhists 315,801, Muslims 27,530,321, Christians 180,572.

Bihar and Orissa: Total population 37,676,576 of which Hindus are 31,010,660, Muslims 4,264,776, Christians 341,710.

Bombay: Total population 21,854,841 of which Hindus are 16,619,866, Sikhs 20,723, Jains 199,979, Buddhists 1,890, Zorastrians 89,543, Muslims 4,452,133, Christians 317,042, Jews. 17,443.

Burma: Total population 14,645,969 of which Hindus are 574,697, Jains 77,895, Muslims 606,841.

Central Provinces and Berar: Total population 15,507,723 of which Hindus are 13,460,105, Muslims 682,854, Christians 50,584.

Coorg: Total population 163,327 of which Hindus are 146,007, Muslims 13,777, Christians 3,430.

Delhi: Total population 636,246 of which Hindus are 398,863, Sikhs 6,437, Jains 5,345, Muslims 206,960, Christians 16,989.

Madras: Total population 46,575,670 of which Hindus are 40,392,900, Muslims 3,316,083, Christians 1,770,328.

North-Western Frontier Province: Total population 2,425,076 of which Hindus are 142.977, Sikhs 42,510, Muslims 2,227,303, Christians 12,213.

The Punjab: Total poulation 23,580,852 of which Hindus are 6,328,588, Sikhs 3,064,144, Jains 35,284, Buddhists 5,723, Muslims 13,332,460., Christians 414,788.

United Provinces of Agra and Oudh: Total population 48,408,763 of which Hindus are 40,905,523, Sikhs 46,500, Jains 67,954, Muslims 7,181,927, Christians 205,009.

STATES AND AGENCIES

The following are the grand total for States and Agencies:

The total population is 79,080,571 of which Hindus are 61,396,377, Sikhs 1,114,273, Jains 796,613, Buddhists 56,841, Muslims 10,658,418, Christians 2,431,091.

Following are the details:

Assam States: Total population is 625,606 of which Hindus are 272,890, Muslims 24,600, Christians 46,660.

Baluchistan States: Total population is 405,109 of which Hindus are 11,148, Muslims 393,885.

Baroda States: Total population is 2,443,007 of which Hindus are 2,152,071, Sikhs 521, Jains 48,408, Zorastrians 7,127, Muslims 182,630, Christians 7,262.

Bengal States: The total population is 973,316 of which Hindus are 641,892, Buddhists 14,532, Muslims 312,619, Christians 2,768.

Bihar and Orissa States: The total population is 4,651,076 of which Hindus are 4,193,878, Muslims 19,807, Christians 74,613.

Bombay States: The total population is 4,468,343 of which Hindus are 3,921,056, Jains 87,368, Muslims 414,865, Zoroastrians 1,468 and Christians 16,011.

Central India Agency: Total population is 6,615,120 of which Hindus are 5,835,486, Sikhs 1,426, Jains 99,780, Muslims 376,173 and Christians 10,476.

Central Provinces States: The total population is 2,483,214 of which Hindus are 1,788,401, Muslims 23,254 and Christians 51,701.

Gwalior States: Total population is 3,523,070 of which Hindus are 3,271,576, Jains 45,079, Muslims 204,297 and Christians 1,198.

Hyderabad State: Total population is 14,437,541 of which Hindus are 12,173,327, Sikhs 5,197, Jains 21,543, Muslims 1,535,022, and Christians 151,946.

Jammu and Kashmir State: Total population is 3,646,244 of which Hindus are 734,607, Sikhs 50,662, Buddhists 38,725, Muslims 2,817,695 and Christians 2,177.

Madras States: Total population is 6,754,484 of which Hindus are 4,323,150, Muslims 467,396 and Christians 1,958,811.

Mysore State: Total population is 6,557,302 of which Hindus are 6,015,880, Muslims 398,628 and Christians 87,538.

N. W. F. P. (Agencies and tribal areas): Total population is 46,451 of which Hindus are 13,651, Muslims 23,086, Sikhs 5,425 and Christians 4,286.

Punjab States: Total population is 4,910,005 of which Hindus are 2,271,133, Sikhs 1,007,480, Muslims 1,597,436, Christians 4,565.

Rajputana Agency: Total population is 11,225,712 of which Hindus are 9,578,805, Sikhs 41,605, Jains 300,748, Muslims 1,069,325, and Christians 5,778.

Sikkim States: Total population is 109,651.

United Provinces States: Total population is 1,206,070 of which Hindus are 950,724, Muslims 252,131, Christians 2,890.

Western India States Agency: Total population is 3,999,250 of which Hindus are 3,246,803, Jains 203,626, Muslims 545,569 and Christians 1,396.

THE LLOYD BARRAGE

AN ACCOUNT OF THE PROJECT

The Lloyd Barrage and Canals Project, which has its headquarters on the Indus river, is the largest single irrigation scheme undertaken in any part of India. The proposals which led up to it were under consideration and discussion for over twenty years prior to its sanction finally in April, 1923. The construction was put in hand in the month of July, 1923. The Project is the latest development in the process of improvement and extension of the primitive inundation canals, which have been going on ever since the British occupation of Sind in 1843.

2. Sind depends for its prosperity on the river Indus. The heavy amount of silt which the river carries in its tortuous course has been deposited over the surrounding country from time immemorial and this has formed the rich fertile land which comprises the cultivable area. This cultivable area again depends for its irrigation on the river Indus, the rainfall in Sind being scanty and precarious. But the supplies in the Indus are varying. For nearly eight months of the year, it is comparatively a small river and excepting some lands which depend on the old Fuleli Canal and the comparatively modern Sukkur and Jamrao Canals no other land can, during the period of low supply, take advantage of its waters as they flow at a very low level. Most of this discharge therefore passes down the river into the Arabian Sea and is thus wasted.

3. This uncertainty of supply, so uncertain that no cultivator has been in a position to forecast what is likely to happen a fortnight ahead, has led to haphazard cultivation and the cultivator has felt that *kismat* rather than his own systematic exertions is the ruling factor in his agricultural operations. To put an end to this uncertainty and the lowering of the *morale* of the cultivators, it was necessary to devise some means of assuring a level of water in the river which would permit of more certain and orderly irrigation conditions.

4. This unsatisfactory state of affairs drew the attention of the British Engineers so far back as 1847, when Col. Walter Scott, Superintendent of the Canal and Forest Department, put forward a sugestion for the construction of a bar across the river between Sukkur and Rohri. For nearly sixty years, projects for the control of the Indus at Sukkur were mooted, considered and rejected. Dr. T. Summers resuscitated the subject in 1904 and the

Government of Bombay also felt the necessity of taking steps in this direction. Surveys were restarted in 1916 and a revised project ultimately put forward in 1920 and productive work designed to give an assured supply of water to the country on both the banks of the river Indus.

5. The project was submitted to the Government of India in December, 1910, and by the Government of India to the Secretary of State in October, 1912. The Secretary of State appointed a Comittee of Experts in London to consider the Project. This Committee considered the Project premature and made certain suggestions, one of which was to investigate an alternate site for the Barrage. The site proposed by the Bombay Engineers was above the Sukkur gorge, the idea being to found the Barrage on rock. The London Committee, however, recommended that the Barrage should be founded on sand. The Government of Bombay, not agreeing that the Project was premature, obtained the approval of the Government of India in March, 1916, to the preparation of a complete scheme, including a Barrage with Canals on the both the banks of the Indus. Owing to the Great War, however, it was not possible to do anything till June, 1918, when the work was taken up seriously and the preparation of the Project was vigorously pushed on. A complete scheme was prepared by Mr. A. Musto, Executive Engineer, and submitted to the Government of Bombay in July, 1920. After scrutiny it was submitted to the Government of India, which Government forwarded it with their recommendations to the Secretary of State for sanction in December, 1920. The Secretary of State sanctioned the project in April, 1923. Arrangements were then made for financing the scheme; and it was on the 8th June, 1923, that the matter was brought before the Bombay Legislative Council in a special session, and that body conveyed its approval of the Project to the Governor-General-in-Council on the 9th June, 1923, with the recommendation that the work should be commenced as soon as possible. The work was accordingly commenced on 1st July, 1923.

6. The cost, as estimated by the Government of India, amounted to 18.35 crores of rupees, exclusive of 8-14 lakhs incurred on surveys and investigations, while returns on the sum (thirty years after completion) were computed at 10½ per cent. It was further estimated that the scheme would become productive in nine years after completion.

7. The objects of the scheme, among other things, were to keep out silt from canal mouths, to maintain in the canals a steady

supply at a fairly constant level, to enable higher duties to be realised and secure a better out-turn of crops than under the old canals, and to provide agricultural employment to the population *all the year round.*

8. The Visvesvaraiyah Committee pointed out in 1929, after *an exhaustive enquiry, that the chief characteristic of the under*taking was its boldness of conception and the unusual size. "The site selected for the Barrage is a favourable one and the engineering designs of the scheme, save those to which we have taken exception, are suitable and satisfactory. The scheme is a potential source of great prosperity for Sind and the people of Sind as well welcome it."

9. *Briefly the scheme is comprised of (i)* the construction of a Barrage aross the Indus, about three miles below the Lansdowne Bridge at Sukkur, and (ii) the excavation of seven main canals with their branches, distributaries, minors and water-courses.

10. The Barrage is nearly a mile long, that is, about five times the length of the London Bridge. It has been built of a creamy white limestone, the *arches alone being of a* different material, viz., reinforced cement concrete. Its sill level is at R. L. 177.0 and it will be used to head up water to R. L. 194.5 which is the level at which all the new canals can obtain their required full supply. The end five spans on the right-bank and seven on the left-bank will be used as scouring sluices. Two long walls have been built, one on the right-bank measuring 1,690 feet and the other on the left-bank measuring 1,975 feet. These divide the river longitudinally into three compartments, the two flank ones being capable of carefully controlled water velocities and levels to suit the required conditions of entry of water into the canals.

11. The most difficult part of the work was naturally that which had to be done under water. This was done by constructing coffer-dams round each year's area of operations and de-watering this area by means of pumps.

THE CANALS

12. The excavation of the Canals was carried out by mechanical excavators and by hand labour. It was decided to make use of mechanical excavators for several reasons.

13. During the years 1923-24 to 1925-26 the following preliminary work was carried out:—

(a) Acquisition of land, (b) Construction of quarters on both the banks for officers, their establishment and labour. (c) Purchase and assembly of necessary craft and plant. (d) Construction of necessary railways. (e) Opening of quarries including special provision of power and machinery. (f) Construction of a main power-house. (g) Construction of workshops. (h) Construction of the upstream guide banks.

In 1926-27 the construction of the regulators was commenced and a successful season's work carried out. In the year 1927-28 the actual under-water work in connection with the Barrage proper was taken up and the whole work was completed in stages as under: —

1927-28: —9½ spans on the left-bank and 6½ on the right-bank. The remaining portion of the regulator foundations was also completed.

1928-29: —10 spans on the right-bank and 13 spans on the left-bank.

1928-30: —The central 27 spans.

1930-31: —The divided walls and pavements to the approach channels. The super-structure work was pushed on as the under-water work was being completed and the whole structure, including the hanging of the gates and their fitments, was completed by the end of December, 1931.

CULTIVATION AND PRODUCE

14. The ultimate annual area of cultivation in British territory is expected to be 50.13 lakhs acres which is expected to be under various crops: —

Wheat, 2,440,000 acres; Cotton, 790,000 acres; Rice 625,000 acres; Jowari, Bajri, etc., 695,000 acres, Pulses, 53,000 acres; Oil-seeds, 410,000 acres.

This denoted in produce would mean the following approximate quantities: —

Wheat, 1,133,000 tons; Cotton, 500,000 bales; Rice 447,000 tons; Jowari, Bajri, etc., 298,000 tons; Pulses, 15,000 tons; Oil-seeds, 117,000 tons.

15. The following facts and figures in connection with the construction of the Lloyd Barrage and Canals will be found as interesting as they are important: —

(1) Total latest revised estimated cost of the whole Scheme. Rs. 20,03,00,000; (2) Total estimated cost of Barrage and Head

works, Rs. 5,58,97,000; (3) Total length of canals of all sizes to be excavated, 6,166 miles; (4) Total quantity of earthwork to be excavated in the whole scheme for canals, branches, distributaries and minors, 5,690 million cft.; (5) Total cost of 40 dragline machines employed for excavation work, Rs. 1,06,66,000; (6) Total cost of all machiney employed inclusive of draglines Rs. 4,53,33,000; (7) Total number of bridges and regulators to be constructed. 1,970; (8) Gross area commanded by the scheme (in British Territory), 7.4 million acres; (9) Annual cultivation when area is fully developed (in British Territory), 5.01 million acres; and (10) New area of virgin soil brought under command 1.95 million acres.

News and Notes

The Journal has completed its sixth volume, and the present number commences the seventh. The further increase in the number of its subscribers indicates a wider appreciation of its value and usefulness. Non-Journal members, especially those *in moffussil,* who cannot take direct part in several of the activities of the Association are requested to keep in touch with it by going in for the Journal which contains a full record of all its work, including all the papers read before it.

*   *   *   *   *

The Sixth Annual Report of the Association at the end of this number contains financial and other details about it. Special attention is drawn to the improved financial position and increased membership. A further increase in strength is easily possible, if every member will introduce another in the course of the year.

*   *   *   *   *

The Sixth Annual Meeting of the Association was held at the Teachers' College, Saidapet at 4.30 p.m. on Saturday the 23rd April 1932 with Mr. W. Duraiswami Ayyangar in the chair. After the reading and passing of the Annual Report, the following members were elected for the Working Council for the year 1932-33:

President—M. R. Ry. Rao Saheb T. S. Subramania Ayyar, Avl. M.A., L.T.,

Vice-Presidents—M.R.Ry. S. Lakshmana Ayyar, Avl. B.A.,L.T.
„ K. Rangaswami Ayyangar, Avargal, B.A., L.T.,
„ M. S. Sabhesan, M.A.,

Secretary—M. R. Ry. N. Subrahmanyam, Avl., M.A., L.T., F. R. G. S.

Treasurer—M. R. Ry. C. M. Gopal, B. A., L. T.,

Other members of the Working Council

1. Miss K. S. Ranga Rao, M.A., L.T.,
2. Mr. R. Dann, M.A.,
3. „ B. V. Narasinga Rao, B.A., L.T.,
4. „ Syed Ameeruddin, B.A., L.T., (*Mofussil member*).

*   *   *   *   *

Three ordinary meetings were held in the short term. In the first Mr. *N. Subrahmanyam* delivered on 3-2-32 a lecture on *Geographic Spirit* under the presidency of Rao Saheb T. S. Subramania Ayyar. In the second Mr. C. *Sivaramamurthy* followed up

his earlier geographic studies from Sanskrit sources by reading on 20-2-32 a paper on *The Geography of Venkatanatha's Hamsa-Sandesa* under the presidentship of Prof. V. Rangacharya. In the third *Mr. Sivadhyanananda* read a paper on *The Human Geography of Indo-China* under the chairmanship of Rao Saheb T. S. Subramania Aiyar, the President of the Association. All these papers will be published in the next number of the Journal.

* * * * *

The policy of opening fresh branches of the Association will have to be reviewed and revised in the course of the present year; for, though there is nearly a dozen of them, only a few function properly. Branches are expected to make local studies and show some kind of local activity; as a matter of fact, on the other hand, they are looked upon very often as merely an easy way of getting a free copy of the Journal. It is hoped that better work will be shown by the various branches in the current year.

* * * * *

The Fourth Summer School of Geography was conducted during April 1932 as usual at the Teachers' College, Saidapet. A Report of its work appended at the end of this number, will show the great importance and continued popularity of this useful course.

* * * * *

At long last the authorities of the Madras University have moved in the matter of instituting *a Diploma Course in Geography* by deciding to start it in July 1932. It was repeatedly urged that few colleges could open Geography in the Intermediate Course for want of the qualified staff; and hence the creation of Graduates in Geography is at present out of the question. The institution of the Diploma is, therefore, the only way of cutting the vicious circle; and we congratulate the University on deciding to start it now in spite of the present financial stringency, which shows a recognition of the urgency of the need. There is no doubt that the Diploma Course will be a popular one, at least till some colleges provide for the teaching of Geography in the Intermediate and B. A. classes.

* * * * *

The first examination under the revised S. S. L. C. Scheme is just over; and the Geography paper in it was simple and straightforward, and was universally liked. In view of the shortness of time (one hour) for the paper, it would have been preferable that a larger number of small questions are included in it instead of three large questions. The test can then be better spread over the whole syllabus, which comprises a three years' study, so that

there will be less of an element of chance in the paper. This being the first examination under the new scheme, a proper standard could have been set by introducing some of the modern achievement tests in several of the papers with a sure gain in reliability and objectivity. Will the S. S. L. C. Board give a lead in this right direction at least next year?

* * * * *

The Director of Public Instruction has circularised schools and guilds as to the desirability of making any changes, especially by way of lightening, in the present syllabus in the light of working it so far. We are against tampering and tinkering with the syllabus every now and then without giving sufficient time for real opinion to be formed from experience. We feel that the Syllabus in Geography is quite all right as it is, and needs no change or deletion. But in case general opinion is in favour of further lightening, we would suggest that Part IV (Climatic Studies and Regions of the World) is deleted rather than any particular continent; for, the World is the unit in Geography, and no continent should be considered alien to merit omission.

* * * * *

For want of qualified staff no men's college provides at present for teaching Geography in the Intermediate; and owing to financial stringency, Government has not been able to open the subject in the Presidency College. But can there not be an opportunity given to male students also to study the subject in the Intermediate Course by transferring the Geography Department of the Queen Mary's College to the Presidency College? B. A. course in it can then be developed there in time. We would strongly commend this idea to the Department and the Government.

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We have great pleasure in welcoming back Messrs. George Kuriyan and B. M. Thirunarayanan, who have recently returned from England after taking a Degree in Geography. It is hoped that their training abroad will be appreciated and utilised by the University Authorities in South India.

Reviews

India. World and Empire by Herbert Pickles (Oxford University Press), Revised edition (1932). Price Rs. 1—12—0.

In this revised edition the arrangement of topics in the original book has been modified so as to suit the syllabus of the Madras Secondary School Leaving Certificate Course. In keeping with the plan of the earlier edition, India and the Empire are treated in greater details, while the other parts of the World receive a simple and clear outline treatment. An 'Empire Summary' at the end of the volume and a large number of diagrams and sketches enhance the value of this useful text-book of World Geography.

A Junior Regional Geography by A. M. Druitt (Longmans, Green & Co.,), 1932.

This is an elementary Geography of the World treated reagionally. Its language is simple and clear; and the volume is illustrated with a number of fine typical pictures of the various natural regions. The coloured regional map of the world on the flyleaf adds to the value of the book. The standard of language and treatment makes it a useful reading book for Form I; but, being written in English, it has to be rendered into the mother-tongue before it can be generally used.

Elements of World Geography (North America and the Southern Continents) by V. K. Sourirajan (P. Varadachary & Co.).

This is the first part of a Geography of the World, written according to the revised S. S. L. C. Syllabus in Madras. The book has been prepared with great care; and the treatment is simple and interesting. Apt quotations from standard authors, revision questions and exercises at the end of each chapter, a large number of sketch-maps and illustrations, and useful climatic and economic data are some of the useful features of this volume.

A Short Course of Geography by V. N. Bijur. (Mangalore) 1932. Price 12 annas.

Meant to be a guide to the teacher rather than a text book to the pupils, the treatment is unequal and not quite systematic, though the style is clear and interesting. The author, who is a scientist and has travelled much, has brought to bear his personal

knowledge and experience in the writing of the book. Re-written from the pupils' point of view and illustrated with suitable sketches and pictures, the volume is sure to be used by students also.

Our World: A Human Geography by Cameron Morrison (Macmillan & Co.). Abridged edition (1931).

This is an abridged edition of the earlier and fuller book by the well-known author of several Geography books, Mr. Cameron Morrison. It is written in a refreshingly delightful and descriptive style, and the treatment is interesting and stimulating with frequent comparisons with the Home Country, though in parts it is disproportionate. Not originally prepared in accordance with the Madras S. S. L. C. Syllabus, a note is given in the beginning indicating the order of study according to that syllabus. The book is copiously illustrated with coloured maps and pictures and diagrams; and the get-up is quite attractive.

The Empire Geographies for Junior Schools (Books I and II) by E. J. S. Lay (Macmillan & Co.) 1932.

These are the first two of a series of four books of descriptive Geography, suitable for the lower school.. The chief parts of the British Empire are treated regionally, in Book I, while in Book II Life in Canada and Australasia is dealt with. The books contain a large number of excellent and typical pictures of the various regions. It is very much to be desired that books of this type are prepared in the mother-tongue for use in South Indian Schools.

The Royal Indian World Atlas by J. Bartholomew (T. Nelson & Sons). New and revised edition (1932). Price 1sh. 6d.

This is a cheap and valuable atlas prepared specially for use in Indian schools by the famous cartographer Mr. Bartholomew; and contains, besides the usual series of world maps and continental maps, half a dozen historical maps of India and nearly a dozen systematic and sectional maps of India. Physical Geography statistics, a useful general index and an etymological list of geographical terms in various languages are other important features of this school atlas.

Books and Journals Received

India, World and Empire by Herbert Pickles (Oxford University Press).

A Junior Regional Geography by A. M. Druitt (Longmans, Green & Co.).

Elements of World Geography (North America and the Southern Continents) by V. K. Sourirajan (P. Varadachary & Co.).

A Short Course of Geography by V. N. Bijur (Mangalore).

Our World: A Human Geography by Cameron Morrison (Macmillan & Co.).

The Empire Geographies for Junior Schools Books I and II by E. J. S. Lay (Macmillan & Co.).

The Royal Indian Atlas by J. Bartholomew (T. Nelson & Sons).

The Geographical Journal—January to April 1932.

Geographical Review (New York)—January and April 1932.

Geography—March 1932.

Canadian Geographical Journal—March 1932.

Rivista Di Geografia—January and February 1932.

Educational Review—January to April 1932.

South Indian Teacher—January to April 1932.

The Quarterly Journal of the Mythic Society—January and April 1932.

Wealth and Welfare—15th January to 15th April 1932.

Rural India—October-November 1931.

The Indian Educator—January and February 1932.

The Journal of the Andhra Historical Research Society—October 1931.

Zamorin's College Magazine—March 1932.

The Hindu Theological High School Magazine—April 1932.

REPORT OF THE

SUMMER SCHOOL OF GEOGRAPHY

HELD IN APRIL, 1932

Under the Auspices of the

Madras Geographical Association

Report of the Fourth Summer School of Geography: April, 1932

The Working Council of the Madras Geographical Association has much pleasure in presenting the following report about the *Fourth Summer School of Geography* held in April, 1932:—

To organise and conduct the Summer School the Working Council, at its meeting held on 3rd February 1932, appointed a special committee consisting of Messrs. S. Balakrishna Ayyar, K. C. Ramakrishnan, T. N. Muthuswami, G. Narayanaswami and Mr. N. Subrahmanyam (Convener); and Mr. S. Lakshmana Ayyar was later co-opted to it. As in 1931 the Council decided to train sixty graduate teachers of Geography, as the demand for trained teachers in the subject was still great. With a view to provide for a fuller course in Practical Work the duration of the course was extended from three to four weeks without, however, enhancing the fees.

The special committee issued a prospectus (Appendix I) which was sent to all District Educational Officers and Presidents of District Boards and published in the local press. The applications were over a hundred; but the committee selected sixty teachers from the various parts of the Presidency, of whom six did not turn up. (Appendix II.)

As in previous years the Director of Public Instruction was kind enough to grant permission to conduct the Summer School in the Geography Department of the Teachers' College, Saidapet, to run the College Hostel for the teachers attending the course and for utilising the services of the Lecturers in Mathematics and Geography of the Teachers' College.

Mr. T. N. Muthuswami Ayyar, Lecturer in Geology and Mr. S. Venkatachari, Instructor in Surveying, Engineering College, Guindy were also permitted to work in the Summer School. The Principal, College of Engineering was kind enough to lend the Surveying Instruments and the Epidiascope needed for the course.

At 10 a.m. on Monday, the 4th April, 1932, M. R. Ry. Rao Bahadur V. N. Visvanadha Rao, Avergal, M.A., B.L., Law Secre-

tary to the Government of Madras formally opened the course with a short speech (Appendix III). As in the previous years Mr. T. N. Muthuswami delivered lectures on Land Forms illustrated by a large number of plates. Mr. Balakrishna Ayyar's lectures were as full as in previous years. Mr. S. Venkatachari took the teachers, in two separate batches, for surveying. Mr. George Kuriyan delivered lectures on Cartography and also conducted the necessary practical work in the subject. Mr. S. Lakshmana Ayyar did map-work. Lectures on the Pedagogy of Geography and the revised S. S. L. C. Syllabus as well as Climatology were done by Mr. N. Subrahmanyam. A few general lectures were also arranged (Vide Appendix IV.).

Excursions were conducted to the Engineering College, St. Thomas Mount, Pallavaram Hill, The Harbour and the Sriperumbudur shale-beds. On the closing day a number of educational films of Geographical interest were shown. As in previous years Messrs. Longmans, Green & Co., Macmillan & Co., and Oxford University Press exhibited their Geographical Publications, Atlases, Maps, Apparatus and Appliances.

The Summer School came to a close on the evening of 30-4-32. Receipts and payments are shown as Appendix V. The course was highly appreciated; and certificates (Appendix VI.) are issued as usual to the teachers that underwent the course.

(By order)
N. SUBRAHMANYAM,
Secretary.

Gopalpuram, Cathedral Post,
Madras, 15—6—1932.

APPENDIX I.

THE MADRAS GEOGRAPHICAL ASSOCIATION, MADRAS.

Summer School of Geography, April, 1932.

It is proposed to run under the auspices of the Madras Geographical Association a Summer School of Geography in the Geography Department of the Teachers' College, Saidapet, from Monday the 4th April to Saturday the 30th April, 1932. It is primarily intended to give training in Practical Geography to teachers of Geography in High Schools, who were not recently trained in the subject.

The Summer School undertakes to provide for the teacher who has already had grounding in Geography work the training which would normally require two terms' work, in the course of a short period, by means of intensive effort along a concentrated course of studies, judiciously chosen for their value and importance from the point of view of the teacher. The course will consist mainly of practical work, field work and excursions, and will present the salient point, in such essential matters as map-making, map-reading and map-correlations, the study of land forms, climate and weather, use of graphic methods and statistics, and construction of diagrams, models and appliances. A course of training in Elementary Surveying will be given by an Instructor from the Engineering College and a few general lectures, illustrative of geographic method and view-point, will also be delivered.

The increasing recognition of Geography as an educational subject, both in the College and the High School, more especially the inclusion of it in the re-modelled S. S. L. C. Course both as a compulsory and an optional subject, have made it incumbent that those who handle the subject shall get up now that amount of practical training, which they have not been able to obtain up till now, and which they will not for some time to come get otherwise. Only so will the teacher be in a position to handle the subject competently in the class and come up to the mark. It is specifically to provide this opportunity that this Association has undertaken to have another Summer School this year.

It is notorious that much of what passes for Geography is only book-work, and it is to counteract this tendency and to inculcate the right methods and give training in them that this Summer School is undertaken.

It is expected that Principals, Headmasters and Managements will, in the interests of efficiency of Geography teaching in their institutions, provide all the necessary facilities for their Geography teachers to come to Madras and undergo training in the Summer School. *The number proposed to be trained is 60.*

A fee of Rs. 15 will be charged for the entire course. This amount should be remitted to the Secretary, after receipt of the intimation of selection, so as to reach him not later than the 25th March, 1932. Those whose fees are not received by that date cannot have their seats guaranteed.

Lodging and Boarding for those that require it will be arranged in the Teachers' College, Saidapet, and the probable expenses will be Rs. 20 for the whole period, payable in advance. Those wishing to stay in the Hostel will remit this amount to the Secretary. Only vegetarian food will be provided. Special arrangements will be made for accommodating lady teachers.

Applications are invited, and the applicants such as are selected will be furnished with other details regarding the course. Applications should be addressed to:—

"*The Secretary,*

THE MADRAS GEOGRAPHICAL ASSOCIATION,

Gopalpuram,

CATHEDRAL POST (MADRAS)"

so as to reach him not later than the 10th March, 1932.

MADRAS.
15*th February*, 1932.

N. SUBRAHMANYAM,
Secretary.

APPENDIX II.

List of Teachers who attended the Summer School of Geography. in April 1932.

No.	Name.	School.
1.	D. Appa Rao.	Municipal High School, Narasaraopet.
2.	N. R. Atmanadhan.	C|o. M. K. Margabandhu, Gangamman Koil Street, Ambur. (N. A.)
3.	N. Achuta Raman.	Mahajana High School, Erode.
4.	P. Bhagavantha Rao.	Hindu College, Masulipatam.
5.	Sister Carola.	St. Anns and Providence School, Calicut.
6	J. A. David.	Scott Xian High School, Nagercoil.
7.	S. J. Devasahayam.	Fabricius High School, Purasawalkam, Vepery Post.
8.	S. Emberumanar.	Coronation High School, Srivaikuntam.
9.	T. G. Esaw.	C|o. Principal, Teachers' College, Saidapet.
10.	M. Ganesa Ratnam.	Board High School, Koilkuntla.
11.	K. I. George.	Mission High School, Ambur.
12.	N. Gopalakrishnan.	C o. C. S. Rajagopala Ayyar, Teacher, Mambalam West.
13.	C. Gopal Rao.	R. R. Middle School, Vanapamula, Ventrapragoda Post. (Krishna District.)
14.	N. John Peterson.	U. L. C. M. Training School for Masters, Tarlupad (Nellore Dt.).
15.	S. V. Jacob.	C|o. Principal, Teachers' College, Saidapet.
16.	Sister Jeanette Fernandez.	European Girl's High School, St. Mary's Convent, Cochin.
17.	Sister Joan.	St. Agnes High School, Mangalore.
18.	Sister Josepha.	C|o. Principal Lady Willingdon Training College, Triplicane, Madras.
19.	A. G. Kanakaraj.	Findlay College, Mannargudi.
20.	S. Kuppuswami Ayyar.	Board High School, Tirukoilur.
21.	K. V. Krishnaswami Ayyar.	K. H. School, Tanjore.
22.	M. Krishnamurthi.	R. C. Secondary Training Institute, Cantt. Trichy.
23.	Sister Lucretia.	St. Joseph's European High School, Calicut.
24.	K. S. Mahadeva Ayyar.	Board Secondary School, Melur, Madura District.
25.	B. V. Madhava Baliga.	S. V. S. Temple High School, Bantwal, (South Canara.)

26.	K. T. Madhavan Nambiar.	Municipal High School, Ooty (Nilgiris).
27.	Sister Matilde Sebastian.	European Girl's High School, St. Mary's Convent, Cochin.
28.	Sister Mechilde.	C/o. Principal, Lady Willingdon Training College, Triplicane, Madras.
29.	A. L. Narasimhamurthi.	High School, Bolarum.
30.	K. Narayana Rao.	H. M. Board High School, Hadagalli.
31.	T. L. Narayana Rao Naidu.	Headmaster, Board Middle School, Kuppam.
32.	V. Pichu Ayyar.	Wesleyan Mission High School, Negapatam.
33.	K. S. Pasupathi Sarma.	Municipal High School, Gudiyatham.
34.	A. Philip.	C/o. Principal, Teacher's College, Saidapet.
35.	N. V. Ramaswami Ayyar.	St. Mary's School, Secunderabad.
36.	R. Rajanayagam.	St. John's College, Palamcottah.
37.	K. V Radhakrishna Sastri.	Loyola College, Madras.
38.	H. Rama Rao.	National High School, Basavangudi, (Bangalore).
39.	T. N. Radhakrishnan.	Ayyampet (Tanjore Dist.)
40.	T. S. Rajagopalan.	St. Peter's High School, Tanjore.
41.	S. Rajagopala Ayyar.	Hindu High School, Triplicane, Madras.
42.	C. Sama Sastri.	Municipal High School, Proddatur, Cuddapah District.
43.	S. Santhanam.	Board High School, Tiruturaipundi.
44.	Y. Suryanarayana.	R. R. B. H. R. High School, Pithapuram.
45.	P. S. Sundaresan.	246, Angappa Naik Street, G. T. Madras.
46.	N. K. Sundaram.	L. H. School, Kattuputtur.
47.	E. S. Sundara Rajan.	Board High School, Solavandan.
48.	T. Subramanya Sarma.	Mylavarapu House, Jagannaikpur, Cocanada.
49.	V. K. Santhanam.	C/o. Principal, Teachers' College, Saidapet.
50.	B. Thangiah.	C/o. Peter Isaac Esq., B. A., L. T., West Gate, Madura.
51.	S. Venkataraman.	No. 8, Reddiappa Mudali Street, Vellore.
52.	V. Venkatarama Sastri.	Board Secondary School, Tanuku.
53.	M. S. Varadachari.	Kodanagar, Tiruvathipuram Post (North Arcot Dist.)
54.	Sister Valeria.	St. Anns Model School, Mangalore.

APPENDIX III.

Opening of the Summer School of Geography, April 1932.

The Fourth Summer School of Geography, conducted by the Madras Geographical Association, was opened at the Teachers' College, Saidapet at 10 a.m. on Monday the 4th April, 1932 by M. R. Ry. Rao Bahadur V. N. Visvanatha Rao, Avl., M.A., B.L., Law Secretary to the Government of Madras. There was a large gathering of visitors and members of the Association.

Mr. S. Lakshmana Ayyar, Vice-President of the Association, in welcoming the teachers who had come for undergoing the special course referred to the fact that the progress of the Madras Geographical Association had been most rapid. Geography is a rational science and in India with its numerous castes and creeds its cultural value must not be forgotten.

Mr. N. Subramania Ayyar, the Secretary of the Association, traced briefly the genesis and work of these summer schools laying stress on the fact that it was meeting a felt need and that the sympathy though not the finance of the Department of Education was with this work of the Association. He cautioned the teachers that what all the course was intended to do was to give a new orientation to their ideas on the subject and to emphasise the importance of practical work in the teaching of the subject.

He pointed out that with the organisation of the Diploma course by the University of Madras from July 1932, probably, this part of the work of the Association is bound to be transferred to other shoulders. In conclusion he requested Rao Bahadur V. N. Visvanatha Rao, one of the foundation members of the Association and a keen student of Geography, to declare the proceedings open.

Rao Bahadur V. N. Visvanatha Rao, Law Secretary to the Government of Madras then delivered the following speech.

"I am deeply thankful to the President and Working Council of the Madras Geographical Association for the honour they have done me by inviting me to open the Fourth Summer School of Geography. I am doubtless aware that I have been chosen to fill the place reserved for one better fitted to address from this Chair and that my opportunity has come through your disappointment.

But for his inevitable absence owing to the call of duty elsewhere, you would have had the honour of commencing your labours under the auspices of Hon'ble the Education Minister, and I share with you your regret that it has not been so ordained.

"My only claim for being here as far as I can judge is that I am one of the foundation members of the Geographical Association, and have done my little bit in popularising the activities of the Association among my friends.

"I rejoice that the acorn planted in 1926 is well on its way to become a sturdy oak and that the Association can even hold its head high among its confreres the wide world over.

"Needless to say, in my own school days I studied the Geography of the old dispensation, which was a series of strings of names of all sorts, and I still have lively recollections how repellant I found its study, for with my poor verbal memory I was unable successfully to commit names to memory and reproduce them and was often sent down to the bottom of the class. When, some years ago, I took up a modern book of Geography, I found to my surprise that it was so suggestive and picturesque to be almost enthralling. It seemed as if one could without the help of the magician's shoes in the fable transport oneself at will to any country or clime or age. I felt that, if I had leisure I should devour the literature of modern Geography for the sheer enjoyment of it, for the panoramic visions it gives of other lands and other climes and for the descriptions of the features which distinguish them from one another and from one's own and for the clear expositions of the why and the wherefore of such distinguishing features.

"Teachers are fortunate, above all other professional men, in the opportunity furnished by their vocation to retain touch with the growing mind of youth, and I have no doubt that it must be to you a source of special delight to impart instruction in such an interesting and living science as Modern Geography to young and intelligent minds.

"Geography is a subject peculiarly amenable to outdoor study. Instruction and recreation can be combined as in the study of no other science, and, in fact, all your wakeful existence can be made one long Geographical study. The votaries of Modern Geography may well look forward to a happy and healthy life. I may assure

you that in drawing this picture I am not altogether speaking from imagination, as I attended a few lectures of a Summer School of Geography at Gooty last year, when I was Collector of Anantapur, and also accompanied the school in some of its excursions.

"The time-table of your summer school shows that a variety of instructional topics are crammed into your school course,—Surveying, climatology, weather study, plant geography, economic geography and cartography. I beseech you to go through your varied course without a sense of hustle or boredom and with a sense of lively enjoyment and a keen desire for the thorough exploration of the several subjects, for it is only thus that you can kindle the light within you and it is only kindling the light within you that you can help to ignite the spark of a live knowledge in those entrusted to your care. I declare this Summer School of Geography open."

The meeting then came to a close with a vote of thanks to Rao Bahadur V. N. Visvanatha Rao and the visitors. The work of the school then commenced at 11 a.m.

APPENDIX IV.

Time-table.

Days.	7 to 9 A.M.	10-30 to 11-50 A.M.	12-10 to 1-30 P.M.	2-30 to 4-0 P.M.	4-30 to 6-3 P.M.
April. 4th Mon		Opening ceremony General instructions.	Nature and scope of Modern Geography	Climatology.	Surveying Batch II.
5th Tues.	Surveying Batch I	Land forms.	Some aspects of its pedagogy.	Do.	Do.
6th Wed.	Do.	Do.	Do.	Do.	Do.
8th Fri	Do.	Do.	Do.	Do.	Do.
9th Satur.	Do.	Do.	Plant Geography.	Excursion to Horticulural gardens.	Do.
11th Mon.	Do.	Do.	Regional Geo.	Climatology.	Do.
12th Tues	Do.	Do.	Do.	Do.	Do.
14th Thurs.	Do.	Quantitative Methods.	Home Geography.	Map work Batch I.	Do.
15th Fri	Do.	Do.	Excursions.	Do.	Do.
16th Satur.	Do.	Do.	Geographical equipment.	Film or Lantern lecture	Do.
18th Mon.	Do.	Do.	Weather Bureau in school.	Map work Batch I.	Do.
19th Tues.	Do.	Do.	Handwork in Geography.	Do.	Surveying Batch II
20th Wed.	Do.	Do.	Modern Tests and Examinations.	Do.	Do.
21st Thurs.	Do.	Cartography	Do.	Do.	Do.
22nd Fri.	Do.	Do.	Preparatory Geography	Batch II	
23rd Satur.	Do.	Do.	Middle school Geography	Film or Lantern Lecures	Do.
25th Mon.	Do.	Do.	S. S. L. C. Syllabus.	Map work Batch II	Do.
26th Tues.	Do.	Economic Geography.	Do.	Do.	Do.
27th Wed.	Do.	Do.	Do.	Do.	Do.
28th Thurs	Do.	Do.	Do.	Do.	Do.
29th Fri	Do.	Do.	Do.	Do.	Do.
30th Satur.	Do.	Do.	Do.	Do.	Do.

N.B.—1-30 to 2-30 P.M. Lunch.

Surveying will be conducted in two batches, on every working day from 7-9 A. and from 4-30 to 6-30 P.M.

Excursions were arranged on holidays to places of geographical interest in neighbourhood.

APPENDIX V.

THE SUMMER SCHOOL OF GEOGRAPHY 1932.

Receipts and Disbursements of the School up to 9th June 1932.

	Rs.	A.	P.		Rs.	A.	P.
Training fees.	840	0	0	Remuneration to Lecturers	640	0	0
				Stationery & Printing	76	14	0
				Postage	6	15	3
				Conveyance charges	5	0	0
				Sundry expenses	2	7	0
				Clerk and Peons	32	8	0
				Show of Films	5	0	0
				Balance (to Association-Account.)	71	3	9
Total	840	0	0	Total	840	0	0

Note.—Two applicants were absent at the session, and the fees returned to them amounting to Rs. 30 and other charges incurred after 9th June, 1932 will be shown in the Association's books.

C. M. COPAL,
Treasurer (M.G.A.)

N. SUBRAHMANYAM,
Secretary (M.G.A.)

Checked and found correct.
14th June 1932.

G. L. NARASIMHAM,
Auditor.

APPENDIX VI

The Madras Geographical Association

Special Course in Geography

APRIL 1932

This is to certify that ....
attended a special course of instruction in Geography, arranged by this Association, including Practical Work in Land Forms, Climate and Weather, Map-reading and Map-Correlations, Statistical Work and Graphic Methods, and Elementary Surveying.

Gopalapuram, Cathedral Post, Madras, April, 1932.

(By Order.)

Secretary.

REPORT OF THE

FIRST REFRESHER COURSE IN GEOGRAPHY FOR MIDDLE SCHOOL TEACHERS

HELD IN MAY, 1932

Under the Auspices of the

Madras Geographical Association

The Madras Geographical Association

Report of the First Refresher Course in Geography for Middle School Teachers: May 1932.

The Working Council of the Madras Geographical Association has the honour to present the following report about the First Refresher Course in Geography for Middle School teachers conducted in May 1932 at Madura.

Having already conducted four Summer Schools for the benefit of High School teachers of Geography, of whom over two hundred were thus trained, the Association had to meet the insistent demand from Middle School teachers who were pressing for a separate course for themselves.

Accordingly the Working Council at its meeting held on 3-2-1932 appointed a special committee consisting of Messrs. G. T. Williams, G. Narayanaswami and N. Subrahmanyam (Convener) to organise and conduct the course. The council also decided that in view of the holding of the Third Annual Conference of the Association at Madura in May 1932 the Refresher Course might also be conducted at the same centre about the time of the Conference.

The special Committee announced through the press and the Educational Journals the running of the course. (Appendix I.)

A fee of Rs. 5 was charged; and twenty teachers were chosen to undergo the course. The batch was fully representative. (Appendix II.) The classes were held in the Union Christian High School, while provision for lodging the teachers undergoing the course was made in the Madura College High School Building.

The Refresher Course lasted from 4th May to 10th May 1932, both days inclusive. It was a very intensive course and the classes were held every day in two sessions of two-and-half hours each. Mr. N. Subrahmanyam, M.A., L.T., F.R.G.S., assisted by Mr. G. Narayanaswami Ayyar, M.A., L.T., conducted the classes. The former delivered all the lectures on the subject, emphasising especially the way in which the subject has to be handled in the Middle School Classes, while the latter took them through a course

of practical work on Climatology, Map-work, Quantitative Methods etc. (Detailed Time-Table-Appendix III). An excursion was conducted to Tirupparankundram Hill about three miles from Madura, where the method of studying the Home Region was illustrated on the spot; and the teachers were shown how to interpret geographical facts of everyday life.

With a view to educate public opinion regarding the importance of the subject and as an adjunct to the Refresher Course a series of Popular Lectures were delivered every evening at the Y. M. C. A. Hall, Madura, by Mr. N. Subrahmanyam, M.A., L.T., F.R.G.S. (Vide Appendix IV). The teachers attending the Refresher Course had thus the advantage of listening to those lectures as well.

The Course came to a close on the evening of 10th May 1932 with a Social and a group-photo.

The teachers evinced very great enthusiasm and followed the course earnestly and diligently, though the subject in its modern phase was unfamiliar to many of them. That the duration of the course was rather short and that it might be extended with advantage by a week was the general feeling among the teachers. It was still felt that the gain of the training was not merely in the new matter and methods learnt but in the newer orientation and outlook regarding the subject.

Gopalapuram, Cathedral, P.O.
Madras, 15-6-1932.

(By order)
N. SUBRAHMANYAM,
Secretary.

APPENDIX I.

THE MADRAS GEOGRAPHICAL ASSOCIATION.

Refresher Course in Geography.

(*at Madura*: *May* 1932).

The course is intended primarily for secondary grade teachers handling the subject in the middle school classes and will be a full time one for six working days (excluding the Sunday that intervenes) from Wednesday, the 4th May to Tuesday, the 10th May 1932. There will be two sessions each day—the forenoon session from 10-30 a.m. to 1-0 p.m., and an afternoon session from 2 p.m., to 4-30 p.m. Besides lectures there will be practical work to be done by the teachers as well as demonstrations of the same by the lecturers and short excursions will be arranged in the neighbourhood to make field studies.

A certificate will be issued at the end of the course taking into account attendance, practical work, etc. A fee of Rs. 5 only will be charged for the entire course. Teachers intending to undergo the course should remit this amount to the Secretary, Madras Geographical Association, Gopalapuram, Cathedral, P.O., Madras along with their application so as to be received by the 25th April, 1932. Those who have already applied need only send in their fee, by the due date.

Gopalapuram, Cathedral, P.O.,
Madras, 5th April, 1932.

N. SUBRAHMANYAM,
Secretary.

APPENDIX II.

List of Teachers who attended the Refresher course in Geography in May 1932.

No.	Name.	School.
1.	Appa Rao, Mr. T. S.	Sourashtra High School, Madura.
2.	Audiwaraham, Mr. K. S.	Supervisor Kallar School, Madura.
3.	Balasubramania Iyer, Mr. D.	V. M. High School, Bodinayakanoor.
4.	Balasubramanian, Mr. R.	Kasimiah Free Secondary School, Rajagiri.
5.	Becket Sam Job, Mr.	Danish Mission Secondary School, Nellikuppam.
6.	Cyrus, Mr. H. C.	S. P. G. School, Thenthiruparai, Tinnevelly District.
7.	Desikachari, Mr. T. E.	Hindu High School, Madurantakam, Chingleput District.
8.	Devasagayam, Mr. A.	C. S. M. Higher Elementary School, Dindigul.
9.	Meenakshisundaram Iyer, Mr. L.	Board High School, Paramakudi.
10.	Narayana Iyer, Mr. R.	S. M. S. Kalasala, Keelasevalpatti (Ramnad).
11.	Ramakrishna Iyer, Mr. G.	Sourashtra High School, Madura.
12.	Ramakrishnan, Mr. P.	Supervisor of Kallar Schools, Usilampatti.
13.	Ramasubba Iyer, Mr. V.	Board High School, Batlagundu.
14.	Raghavendra Rao, Mr. G.	Municipal High School, Kurnool.
15.	Sankara Iyer, Mr. S.	Sourashtra High School, Madura.
16.	Sankaranarayana Iyer Mr. S.	Sourashtra High School, Madura.
17.	Srinivasa Iyer, Mr. S. R.	D. J. High School, Gobichettipalayam.
18.	Subramanyam, Mr. S.	Sethupathi High School, Madura.
19.	Venkataraman, Mr. S.	Sourashtra High School, Madura.
20.	Visvanatha Ayyar, Mr. G. V.	D. J. High School, Gobichettipalayam.

APPENDIX III.

REFRESHER COURSE IN GEOGRAPHY

May, 1932.

TIME—TABLE.

Days	10-30 to 12 Noon	12 Noon to 1 P.M.	1-2 P.M.	2-3 P.M.	3 to 4-30 P.M.
4th Wed.	Nature and Scope of Modern Geography.	Globe studies.	Lunch	Some aspects of its Pedagogy.	Globe studies
5th Thurs.	Regional Geography.	Contours.	Do.	Home Geography.	Contours.
6th Fri.	Home Geography.	Map Work.	Do.	Excursions.*	Map Work.
7th Satur.	Climatology (theory)	Practical work in climatology.	Do.	Weather Bureau in Schools.	Climatology (Prac. work)
9th Mon.	Hand-work in Geography.	Do.	Do.	Middle School Syllabus.	Quantitative methods.
10th Tues.	Middle School Syllabus.	Quantitative Methods.	Do.	Do.	Do.†

Note. * 10-5-32 Excursion to Tirruparankundram Hill.
† 5-6 P.M. on 10-5-32. Social.

APPENDIX IV.

POPULAR LECTURES* ON GEOGRAPHY.

Y. *M.* C. *A. Madura.*

BY

MR. N. SUBRAHMANYAM.

4—5—32.	How to make the Best of Travel.
5—5—32.	Geographic Spirit.
6—5—32	Synthetic Outlook.
7—5—32.	Geography and Citizenship.
9—5—32.	The New Geography.
10—5—32.	Things Around Us.
11—5—32.	Map of Knowledge.

*Lectures were delivered everyday between 6-30—7-30 p.m.

THE SIXTH ANNUAL REPORT OF THE MADRAS GEOGRAPHICAL ASSOCIATION 1931-32.

THE WORKING COUNCIL FOR 1931-32.

PRESIDENT.

Mr. Rao Saheb T. S. Subramania Ayyar, M.A., L.T.

VICE-PRESIDENTS.

Mr. S. Lakshmana Ayyar, B.A., L.T.
Mr. K. Rangaswami Ayyangar, B.A., L.T.

SECRETARY.

Mr. N. Subrahmanyam, M.A., L.T., F. R. G. S.

TREASURER.

Mr. C. M. Gopal, B.A., L.T.

OTHER MEMBERS.

Mr. T. N. Muthuswami, M.A., L.T.
Mr. K. C. Ramakrishnan, M.A.
Mr. V. K. Sourirajan, M.A., L.T.
Mr. Rao Saheb C. M. Ramachandra Chettiyar, B.A., B.L., (Mofussil member).

THE SIXTH ANNUAL REPORT OF THE MADRAS GEOGRAPHICAL ASSOCIATION, 1931-32.

The Working Council of the Madras Geographical Association has great pleasure in presenting the following Report for the year 1931-32:—

During the year under review the Association continued its remarkable progress of the previous year, as is evidenced by the increased membership and the improved financial position as well as by its many-sided activities.

The strength of the Association at the commencement of the year was 267. During the year 6 members resigned, 4 members died, and 28 were removed from the list for non-payment of arrears of subscription. 130 new members were admitted in the same period, while 8 old members were reinstated on payment of arrears. The strength on 31-3-32 therefore stands at 367.

Of the losses by death special mention has to be made of the demise of Mr. P. T. *Srinivasa Ayyangar*, the Second *President* of the *Association* and a pioneer of Geographical education in South India. A dynamic personality of versatile talents, genial manners and basic common-sense, he has been of immense value to the Association on many an occasion during its formative period. Equally great is the loss of Mr. M. S. Subramaniam, who was cut off in the prime of youth at the threshold of a brilliant career, which his energy, enthusiasm and industry assured him. Earnest to a fault, he kept himself abreast of the progress of Geography, here and elsewhere. The late Mr. T. R. Rajaratnam Pillai, Deputy Inspector of Schools, Coimbatore was one who shouldered as Secretary of the Reception Committee the whole burden of organising the First Geographical Conference at Coimbatore; and much of the success of that Conference was largely due to his marked ability and unostentatious work.

It is gratifying to note that there are now 4 life members; and it is hoped that more members will in course of time convert themselves into life members under Rule 8 of the Rules of the Association by paying Rupees Hundred only within a period of two years. Twenty monthly instalments of Rs. 5 each will be an easy method of paying the amount. A life member is entitled to get the Journal gratis, and will have no future payments to make by way of subscription. The increase in the number of life members will partly supply the needed capital fund for the Association.

The Journal had 190 subscribers during the year as against 159 in the preceding year. Of these 73 are official subscribers as against 61 in the pre-

vious year. Of the member subscribers 3 have discontinued, while there has been an addition of 22, making a total of 117. The continued increase in the number of subscribers to the Journal is due to the better appreciation of its usefulness on the part of teachers, who have availed themselves in large numbers of the concession to pay their subscription (including that for the Journal) in instalments of whole rupees at their option. The increased income that resulted has enabled the size of the Journal to be increased to more than double what it was in 1926 when it was started. It is hoped that the present non-Journal members will, either availing themselves of the concession or otherwise, gradually go in for the Journal until there is only one class of members—all getting the Journal. It will then be possible to further increase the size and improve the quality of it as well as increase the number of issues during the year.

Another point to note is the continued demand for the back numbers of the Journal whose permanent value is now being recognized as they contain the original papers read before the Association. These are available at half-rates to institutions as well as members.

Financial position.—The financial position as seen from Appendix A shows a balance of Rs. 1,521-12-as-11 ps. of which Rs. 556-0-0 remain as arrears of subscription to be collected. It is hoped that members will be more prompt and regular in remitting their subscription, and help to reduce their arrears.

The Working Council met 7 times during the year. A list of the ordinary meetings of the Association is given in Appendix B.

The Second Geographical Conference was held at Palghat on the 20th May 1931 and the following three days under the Presidency of Professor V. Rangachariyar, M.A., L.T., when 18 original papers on various aspects of the Geography of the District of Malabar were read and discussed (Vide Appendix C). The Presidential Address has been published in Volume VI, No. 2. while the others have been brought together in Volume VI, Nos. 3-4, as a special double number.

The Third Geographical Conference will be held at Madura in May next, as usual along with the S. I. T. U. Conference, when the districts of Madura and Ramnad will be studied in the same way in which Coimbatore and Malabar were studied in the two previous years. It is intended to arrange at the time for a few excursions also to places of interest in the district.

During the year under Report 6 new branches of the Association were constituted. Of these, the Vizagapatam branch has a good record of work to its credit. (Vide Appendix D). It is earnestly to be hoped that the other branches will evince a similar interest so that the message of the New Geography may be broad-casted from what may be called *a thousand platforms.*

The Third Summer School of Geography held in April 1931 was a very successful one, and the Report of its working was published in Volume VI, No. 1 of the Journal. Owing to the large demand that there is still in evidence, another Summer School (Fourth) is being held this month, which was formally opened on 4th April 1932 by M.R.Ry. Rao Bahadur V. N. Visvanatha Rao Avl., M.A., B.L., Law Secretary to the Government of Madras.

Two Refresher Courses in Geography were arranged during the year. One was organised by the Anantapur District Teachers' Guild, and was held in June 1931, while the other was organised by the Cochin Educational Department, and was conducted during December 1931. In both of them, the classes were conducted by the Secretary of the Association, assisted in the latter case by another specialist member of the Association. It is proposed to run a short but intensive Refresher Course at Madura prior to the Geographical Conference, specially for the benefit of secondary grade teachers handling the subject in the middle school classes.

The first examination in Geography after the inclusion of the subject in the remodelled S. S. L. C. Syllabus was held in March 1932.

Another gratifying feature in the progress of Geography is the step taken by the University Authorities to institute a Diploma Course in Geography. The long-pending proposal has now taken a definite shape; and the course is likely to be opened in July 1932. It is to be hoped that at the end of 1932-33, there will be a sufficient number of teachers, possessing a high knowledge in the subject so that it might be possible for a number of colleges to open University Courses in the Subject.

In conclusion, the Working Council is gratified to find that Geography is beginning to gain its proper place in the educational systems of South India.

Gopalapuram, Cathedral Post,
Madras, 16th April 1932.

N. SUBRAHMANYAM,
Secretary.

APPENDIX A.

THE MADRAS GEOGRAPHICAL ASSOCIATION, MADRAS.

BALANCE SHEET AS AT 31ST MARCH 1932.

LIABILITIES.		Rs.	A.	P.	ASSETS.		Rs.	A.	P.
Advance Subscriptions ..		52	0	0	Furniture (at cost) ..		21	0	0
Summer School ..		26	12	6					
M. G. Association Fund:					**Subscriptions outstanding:**				
Balance as per last Balance sheet	Rs. 836 4 4				Life Membership ..		165	0	0
Surplus since last B. S.	,, 627 12 1				Ordinary Membership for 29-30.	Rs. 1			
		1,464	0	5	,, 30-31.	,, 26			
					,, 31-32.	,, 217	244	0	0
					The Journal for 27-28	,, 2			
					,, 28-29.	,, 4			
					,, 29-30.	,, 4			
					,, 30-31.	,, 19			
					,, 31-32.	,, 118	147	0	0
					Cash and Other Balances:				
					Cash on hand ..		56	0	0
					Balance with Indian Bank Ltd., Madras ..		909	0	10
					Balance of Imprest ..		0	12	1
Total	Rs.	1,542	12	11	Total	Rs.	1,542	12	11

N. SUBRAHMANYAM, Secretary. C. M. GOPAL, Treasurer. G. L. NARASIMHAM, Auditor.

AUDITOR'S REPORT.

I have examined the above Balance Sheet with the books and vouchers kept by the Secretary of the Association, and have obtained the needed information and explanations. In my opinion, the said Balance Sheet is properly drawn up so as to exhibit a true and correct view of the state of affairs of the Association according to the best of my information and the explanations furnished and as shown by the books of the Association.

Madras,
10*th April*, 1932.

G. L. NARASIMHAM,
Govt., Diploma'd Accountant,
AUDITOR.

THE MADRAS GEOGRAPHICAL ASSOCIATION, MADRAS.

Income and Expenditure Account for the Year Ending 31st *March* 1932.

EXPENDITURE.	Rs.	A.	P.	INCOME.	Rs.	A.	P.
To Journal Expenses ..	896	4	0	By Subscriptions due:			
,, Cooly and Conveyance ..	16	6	3	Life Membership ..	200	0	0
,, Expenses at Branches ..	34	0	0	Ordinary Membership ..	747	0	0
,, Do. Meetings ..	9	4	0	The Journal ..	1,023	0	0
,, Postage and Telegrams ..	229	0	0	,, Sale of copies of Journal ..	66	5	0
,, Printing and Stationery ..	26	14	3	,, Postal Charges recovered ..	12	5	0
,, Clerical services ..	58	0	0	,, Interest from Bank ..	23	10	7
,, Palghat Conference Expenses ..	96	13	0	,, Miscellaneous ..	1	4	0
,, Telephone, Bank and Sundry expenses ..	11	3	0				
,, Balance, c/d ..	695	12	1	Total Rs.	2,073	8	7
Total Rs.	2,073	8	7	By Balance, b/d ..	695	12	1
To Irrecoverable subscriptions written of:—							
Ordinary Membership ..	55	0	0				
The Journal ..	13	0	0				
,, Surplus (to Balance Sheet) ..	627	12	1				
Total Rs.	695	12	1	Total Rs.	695	12	1

N. SUBRAHMANYAM, Secretary. C. M. GOPAL, Treasurer. G. L. NARASIMHAM, Auditor.

THE MADRAS GEOGRAPHICAL ASSOCIATION, MADRAS.

Statement of Receipts and Disbursements for the Year Ending 31st *March* 1932.

RECEIPTS.	Rs.	A.	P.	DISBURSEMENTS.	Rs.	A.	P.
Opening Balances:				Journal Expenses ..	896	4	0
Cash on hand ..	7	11	6	Cooly and Conveyance ..	16	6	3
Balance with Indian Bank ..	502	13	3	Expenses at Branches ..	34	0	0
Do. of Imprest ..	14	9	7	Do. Meetings ..	9	4	0
Do. with Erode Branch ..	0	12	0	Postage and Telegrams ..	229	0	0
				Printing and Stationery ..	26	14	3
Subscriptions:				Summer School ..	18	10	0
Life Membership ..	110	0	0	Clerical services ..	58	0	0
Ordinary Membership ..	571	0	0	Palghat Conference expenses ..	96	13	0
The Journal ..	975	0	0	Telephone, Bank and Sundry Expenses ..	11	3	0
Sale of copies of Journal ..	66	5	0				
Postal Charges recovered ..	12	5	0				
Advance Subscriptions ..	50	0	0	**Closing Balances:**			
Interest from Bank ..	23	10	7	Cash on hand ..	56	0	0
Miscellaneous ..	1	4	0	Balance with Indian Bank Ltd. ..	909	0	10
Summer School ..	26	12	6	Balance of Imprest ..	0	12	1
Total Rs.	2,362	3	5	Total Rs.	2,362	3	5

N. SUBRAHMANYAM, Secretary. C. M. GOPAL, Treasurer. G. L. NARASIMHAM, Auditor.

APPENDIX B.

LIST OF MEETINGS HELD IN 1931-32.

DATE.	SUBJECT.	LECTURER.	CHAIRMAN.
18— 7—31	Annual meeting: Geographical Films		Mr. S. Lakshmana Iyer
15— 8—31	*Geography of Kalidasa*	Mr. C. Sivaramamurthy	Prof. V. Rangacharya
12— 9—31	Cotton in South India	Mr. A. S. Rajamanikkam	Dr. P. J. Thomas
12—10—31	Localisation of Industries in India	Mr. P. S. Loganathan	Prof. S. Subbarama Ayyar
3— 2—32	Geographic Spirit	Mr. N. Subrahmanyam	Mr. Rao Saheb T. S. Subramania Iyer
20— 2—32	Geography of Venkatanatha's Hamsa-Sandesa	Mr. C. Sivaramamurthy	Prof. V. Rangacharya
10— 3—32	Human Geography of Indo-China	Mr. Sivadhyanananda	Mr. Rao Saheb T. S. Subramania Iyer

APPENDIX C.

List of Papers read at the Second Geographical Conference at Palghat, May 1931.

1. A note on the Physical Geography and Geology of Malabar by Mr. T. N. Muthuswami Ayyar.
2. Geology of the Palghat Gap by Mr. M. S. Subramaniam.
3. The Meteorology of Malabar by Mr. B. G. Narayan.
4. Types of Forest Flora in Malabar by Mr. G. Viswanathan.
5. Agricultural Geography of the Malabar District by Mr. V. K. Sourirajan.
6. Field Irrigation in Malabar by Mr. A. Swaminatha Ayyar.
7. Some Mediaeval Notices of Malabar Pepper by Mr. A. Appadorai.
8. Markets for Malabar Produce by Mr. K. C. Ramakrishnan.
9. Cottage Industries of Malabar by Mr. R. Suryanarayana Rao.
10. The Urban Geography of Malabar by Mr. R. Dann.
11. Some Aspects of the Geography of Calicut by Mr. N. Subrahmanyam.
12. Public Health of Malabar in relation to Environment by Major A. M. V. Hesterlow.

13. A Note on Transport and Communications in Malabar by Mr. N. Subrahmanyam.

14. The Relations between Malabar and the Tamils by Mr. Rao Saheb C. M. Ramachandra Chettiyar.

15. Early European Trade Centres of Malabar by Mr. S. Natesan.

16. Some Place-names of Malabar by Mr. P. Rama Pisharody.

17. Roman Trade-Centres on the Malabar Coast by Prof. P. J. Thomas.

APPENDIX D.

List of Meetings of the Vizag Branch.

	Subject.	*Lecturer.*
1.	Distribution of Population	Prof. M. Venkatarangaiah.
2.	Economic Geography of the Vizagapatam District	Mr. T. Appalanarasayya.
3.	Nature and Scope of Modern Geography	Mr. N. Subrahmanyam.
4.	Geographic Research	Mr. N. Subrahmanyam.
5.	Human Geography of Bhadrachalam Taluk	Mr. V. Satyanarayana.
6.	Geography of Everyday Life	Dr. C. Ramamurti.
7.	How to get the best out of Travel	Mr. N. Subrahmanyam.

Openi...
Cash on ...
Balance w...
Do. of Impr...
Do. with Ero...

Subscriptions:
Life Membership
Ordinary Membership
The Journal
Sale of copies of Journal
Postal Charges recovered
Advance Subscriptions
Interest from Bank
Miscellaneous
Summer School

Total Rs. 2,362 3

N. SUBRAHMANYAM,
Secretary.

APPENDIX E.

Members of the Association.

...on.), District Educational Officer, Calicut.

... T., Headmaster, Govt., Muhammadan High

... T., Headmaster, Board Secondary School,

...ons.), University Lecturer in Statistics, Madras.

...ollege, Saidapet.

...ess, Govt., Training School for Women,

...Headmaster, Municipal High School,

..., Lady Sankara Nair Board Girls'

Mr. A. Ananta Bhat, B.A., L.T., Teacher, St. Aloysius College, Mangalore.
„ M. S. Anantakrishna Iyer, B.A., Teacher, High School, Trichur.
„ L. A. Anantanarayana Iyer, B.A., L.T., Headmaster, Board High School Manjeri.
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„ C. S. Anantarama Iyer, B.A., L.T., Asst., Board High School, Cherukunnu.
„ V. Annaiyya, B.A., Asst., S. M. D. H. High School, Tirupati.
„ P. Appa Rao, Teacher, Board High School, Kollur (Guntur Dt.).
„ A. Appadorai, M.A., L.T., Lecturer, Loyola College, Nungumbakkam, Madras.
„ T. Appalanarasayya, M.A., Asst., Govt., School of Commerce, Vizagapatam.
„ K. Appunni Kaimul, B.A., L.T., Teacher, Boys' High School, Kunnamkulam.
„ S. Balakrishna Iyer, B.A., L.T., Lecturer, Teachers' College, Saidapet.
„ A. Balasundaram, B.A., Teacher, Board High School, Chengam.
„ V. S. Balasundaram, B.A., Teacher, R. C. Training School, Tindivanam.
„ E. E. Berry, B.A., Headmaster, Stanes European High School, Coimbatore.
„ C. Bhimasena Rao, B.A., L.T., Teacher, P. R. College School, Coconada.
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Rev. F. C. Browne, M.A., L.T., Principal, St. Joseph's Indian Section, Bangalore.
Mr. H. Champion, M.A., Principal, Teachers' College, Saidapet, Madras.
„ K. R. Chandrasekhar, B.A., Teacher, S. P. G. High School, Secundarabad.
„ C. D. S. Chetti, M.A., Registrar, Andhra University, Waltair.
„ A. S. Chidambaram Pillai, B.A., Teachers' College, Saidapet.
Srimathi C. Chinnammu Mannadissiyar, B.A., Headmistress, Board Moyan Girl' High School, Palghat.
Mr. K. Dakshinamurti, B.A., L.T., Deputy Inspector of Schools, Nellore.
„ Rao Saheb S. Dandapani Ayyar, B.A., Census Superintendant, Pudukkottah.
„ J. Daniel, B.A., L.T., Board High School, Chittoor.
R. Dann, Director of Town-planning, Chepauk, Triplicane, Madras.

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Mrs. A. Devasahayam, 'Church View', Fort, Salem.

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„ V. Garudadri, Commercial Instructor, High School, Devakottai.

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„ N. Gopalan, B.A., Teacher, National High School, Mannargudi.

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„ C. P. Govindan Nair, B.A., L.T., 1st Asst., High School, Cherppu, (Cochin State).

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„ V. Guruswami Sastri, B.A., L.T., Headmaster, High School, Tirukkattupalle.
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Major A. M. V. Hesterlow, I.M.S., (on leave).
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„ V. Jagannatha Rao, M.A., L.T., Headmaster, Govt., Training School, Guntur.
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„ V. Jagannathaswami, M.A., Principal, Rajah's College, Parlakimidi.
„ K. Janaki Rao, M.A., Principal, Maharajah's College, Vizianagaram.
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„ Bh. Krishna Rao, District Scout Organiser, Vizagapatam.
„ T. D. Krishna Rao, B.A., L.T., Deputy Inspector of School, Kovvur Range, Nellore.

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„ S. V. Krishnamachari, Asst., Board High School, Sulurpet.
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„ T. S. Krishnamurti Ayyar, B.A., L.T., Asst., Hindu College School, Masulipatam.
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„ V. S. Krishnaswami, B.A., L.T., Teacher, G. N. S. School, Madras.
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„ C. Krishnaswami Pillai, M.A., Professor of Geology, Presidency College, Madras.
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„ B. Lakshminarayana Sastry, M.A., L.T., Deputy Inspector of Schools, Vizagapatam.

„ T. Lakshmipathy, B.A., L.T., Teacher, Board High School, Dharmavaram.

„ P. S. Loganathan, M.A., University Reader, in Economics, Senate House, Madras.

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Mr. C. K. Madhavan, B.A., L.T., Chananvilakom, Nedunganda, Ajengo Post.

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Mr. G. Mahadeva Ayyar, B.A., L.T., Asst., Hindu Theological High School, Madras.

„ V. K. Mahadeva Sastri, B.A., B.L., Advocate, "Lalita Sadanam," Royapettah, Madras.

„ C. Mahadevan, M.A., Asst., Superintendant, Geological Survey, Lingsugur, (Nizam's State).

„ N. Maindappa, B.A., L.T., Headmaster, Govt. Training School, Bangalore Cant.

„ K. C. Manavikraman Rajah, B.A., L.T., Teacher, Zamorin's College School, Calicut.

„ M. D. Manickam Pillai, B.A., L.T., Headmaster, Fabricius High School, Purasawakkam, Madras.

„ D. Manuel, B.A., L.T., Asst., Union Christian High School, Madura.

„ M. L. N. Murthi, M. Sc., B.L., Virinjipuram, (N. Arcot).

„ M. Muthanna, Asst., Govt. Training School, Bangalore Cant.

„ B. S. Muthukrishnan, B.A., L.T., Asst., Muthialpet High School, Madras.

„ T. N. Muthuswami, M.A., L.T., Lecturer, Engineering College, Guindy, (Saidapet Post).

„ A. Nagaraja Iyer, B.A., L.T., Teacher, Municipal High School, Villupuram.

„ S. V. Nagayya, B.A., L.T., Teacher, Board High School, Uttaramerur.

„ G. L. Narasimham, G. D. A., F.R.S.A., Auditor, 19,Linghi Chetty Street, Madras.

Mr. K. Narasimha Raghavan, B.A., Teachers' College, Saidapet, Madras.
„ D. Narasimhachari, Asst., Hindu Theological High School, Madras.
„ M. L. Narasimha Sastri, B.A., B.Ed., Teacher, E. L. M. High School, Hindupur.
„ K. L. Narasimhayya, Asst., 17 G.M. Street, Tirupati.
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„ P. Narasinga Rao, B.A., B.Ed., Asst., Municipal High School, Adoni.
„ K. V. Narayana, B.A., L.T., Teacher, P. R. College School, Coconada.
„ P. K. Narayana Ayyar, B.A., L.T., Math. Asst., Board Girls' High School, Ottapalam.
„ V. Narayana Iyer, M.A. Asst., Accountant-General, Fort St. George, Madras.
„ Mr. M. Narayana Menon, B.A., B.L., Advocate, Palghat.
„ Rao Bahadur H. Narayana Rao, M.A., "Shankar Bagh", Landon's Gardens, Kilpauk, Madras.
„ T. K. Narayana Rao, B.A., L.T., Asst., Municipal High School, Udumalpet.
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